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IN THE

Supreme Court of the United States

OCTOBER TERM, 1978

AMERICAN IRON AND STEEL INSTITUTE, *et al.*,
Petitioners,

v.

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION,
et al.,

and

UNITED STEELWORKERS OF AMERICA, AFL-CIO,
Respondents.

APPENDICES TO THE PETITION FOR A WRIT OF CERTIORARI

Of Counsel:

ROBERT B. MORRIS
HACKER & MORRIS
1730 Rhode Island Ave., N.W.
Washington, D.C. 20036
(202) 833-1650

December 9, 1978

MAX O. TRUITT, JR.
NEIL J. KING
WILMER, CUTLER & PICKERING
1666 K Street, N.W.
Washington, D.C. 20006
(202) 872-6000

Counsel for Petitioners

WILSON - EPES PRINTING CO., INC. - 789-0096 - WASHINGTON, D.C. 20001

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APPENDIX A

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

Nos. 76-2358, 76-2359, 76-2424, 76-2371, 76-2372,
76-2629, 76-2630, 77-1016, 77-1025, 77-1088

Re: AMERICAN IRON AND STEEL INSTITUTE
1000 16th Street, N.W.
Washington, D.C. 20036

JONES & LAUGHLIN STEEL CORPORATION
3 Gateway Center
Pittsburgh, Pennsylvania 15263

NATIONAL STEEL CORPORATION
2800 Grant Building
Pittsburgh, Pennsylvania 15219

SHARON STEEL CORPORATION
P.O. Box 291
Sharon, Pennsylvania 16146

SHENANGO INCORPORATED
P.O. Box 3030
Pittsburgh, Pennsylvania 15230

UNITED STATES STEEL CORPORATION
600 Grant Street
Pittsburgh, Pennsylvania 15230

WHEELING-PITTSBURGH STEEL CORPORATION
P.O. Box 118
Pittsburgh, Pennsylvania 15230
Petitioners in Nos. 76-2358 and 76-2371

REPUBLIC STEEL CORPORATION,
Petitioner in Nos. 76-2359 and 76-2372

BETHLEHEM STEEL CORPORATION
Bethlehem, Pennsylvania 18016
Petitioner in No. 76-2424

ARMCO STEEL CORPORATION
703 Curtis Street
Middletown, Ohio 45043
Petitioner in No. 76-2629

CRUCIBLE MATERIALS GROUP
COLT INDUSTRIES INC.
P.O. Box 88
Pittsburgh, Pennsylvania 15230

CYCLOPS CORPORATION
650 Washington Road
Pittsburgh, Pennsylvania 15228

INLAND STEEL COMPANY
30 West Monroe Street
Chicago, Illinois 60603,
Petitioners in No. 76-2630

YOUNGSTOWN SHEET AND TUBE COMPANY,
Petitioner in No. 77-1016

AMERICAN COKE AND COAL CHEMICALS INSTITUTE
1010 16th Street, N.W.
Washington, D.C. 20036
Petitioner in No. 77-1025

C F & I STEEL CORPORATION,
Petitioner in No. 77-1088

v.

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
UNITED STATES DEPARTMENT OF LABOR
UNITED STATES OF AMERICA,
Respondent

UNITED STEELWORKERS OF AMERICA, AFL-CIO,
Intervenor

Petition for Review of a Standard of the
Occupational Safety and Health Administration

Argued January 5, 1978

Before ROSENN and HIGGINBOTHAM, *Circuit Judges*, AND
VAN ARTSDALEN, *District Judge* *

MAX O. TRUITT, JR., ESQUIRE
MICHAEL S. SCHOOLER, ESQUIRE
WILMER, CUTLER & PICKERING
1666 K Street, N.W.
Washington, D.C. 20006
Attorneys for Petitioners in
Nos. 76-2358, 76-2371, 76-2424,
76-2629, 76-2630, 77-1016,
77-1025

Of Counsel:

ROBERT R. MORRIS, ESQUIRE
HACKER & MORRIS
1730 Rhode Island Avenue, N.W.
Washington, D.C. 20036

RAYMOND T. CULLEN, ESQUIRE
MORGAN, LEWIS & BOCKIUS
123 South Broad Street
Philadelphia, Pa. 19109

DAVID J. TOOMEY, ESQUIRE
FRANK E. MORRIS, ESQUIRE
PENNIE & EDMONDS
330 Madison Avenue
New York, New York 10017
Attorneys for Petitioner in
Nos. 76-2359 and 76-2372

---

* Donald W. Van Artsdalen, United States District Judge for the Eastern District of Pennsylvania, sitting by designation.

Of Counsel:

EDWARD P. WEBER, JR., ESQUIRE
Republic Steel Corporation
P.O. Box 6778
Cleveland, Ohio 44101

JOSEPH W. SWAIN, JR., ESQUIRE
MONTGOMERY, MCCRACKEN, WALKER & RHOADS
20th Floor, Three Parkway
Philadelphia, Pa. 19102

MILES C. CORTEZ, JR., ESQUIRE
WELBORN, DUFFORD, COOK & BROWN
1518 United Bank Center
Denver, Colorado 80290
Attorney for Petitioner in
No. 77-1088

CARIN A. CLAUSS
Solicitor of Labor
BENJAMIN W. MINTZ
Associate Solicitor for Occupational
Safety and Health
ALLEN H. FELDMAN
Assistant Counsel for Appellate
Litigation
DENNIS K. KADE
CHARLES I. HADDEN
Attorneys
United States Department of Labor
Washington, D.C. 20210
Attorneys for Respondents

GEORGE H. COHEN, ESQUIRE
BREDHOFF, GOTTESMAN, COHEN &
WEINBERG
1000 Connecticut Avenue, N.W.
Washington, D.C. 20036

JAMES D. ENGLISH, ESQUIRE
United Steelworkers of America
Five Gateway Center
Pittsburgh, Pa. 15222

Attorneys for Intervenor

Of Counsel:

BERNARD KLEIMAN, ESQUIRE
Suite 1910
One East Wacker Drive
Chicago, Illinois 60601

OPINION OF THE COURT

(Filed March 28, 1978)

(As Amended May 1, 1978)

ROSENN, *Circuit Judge*

These consolidated cases present petitions for review [1] of a new health standard governing employee exposure to coke oven emissions promulgated by the Secretary of Labor ("Secretary") on October 19, 1976, pursuant to the Occupational Safety and Health Act ("the Act"), 29 U.S.C. § 651 et seq.[2] In summary, the standard prescribes particular controls and procedures to reduce coke oven employees' exposure in specified regulated areas to toxic emissions in concentrations no greater than 0.15 mg. of the benzene-soluble fraction of total particulate matter (BSFTPM) per cubic meter of air (0.15 mg/m^3) present during the production of coke averaged over an eight-hour period. Additionally, the standard provides that if the prescribed controls do not reduce emission concentrations to the permissible exposure limit, employers would be re-

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[1] The petitioners are: American Iron and Steel Institute, Jones & Laughlin Steel Company, National Steel Corporation, Sharon Steel Corporation, Shenango, Inc., United States Steel Corporation, Wheeling-Pittsburgh Steel Corporation, the American Coke and Coal Chemicals Institute, Bethlehem Steel Corporation, Crucible Materials Group, Youngstown Sheet & Tube Company, Republic Steel Corporation, C F & I Steel Corporation, Cyclops Corporation and Inland Steel Company.

[2] The standard may be found in 41 Fed. Reg. 46742-46790, (to be codified at 29 CFR § 1910.1029).

Under the Act, the Secretary of Labor is charged with primary responsibility for developing occupational safety and health standards. In practice, however, he has delegated this function to the Assistant Secretary of Labor for Occupational Safety and Health who is the chief administrative officer of the Occupational Safety and Health Administration (OSHA). References in this opinion to the Secretary and OSHA are used interchangeably.

quired to provide respirators and to take additional steps to curtail excess emissions by conducting independent research and development.

Petitioners, coke manufacturers and their trade associations, make three principal claims: (1) the exposure limit of 0.15 mg/m^3 (miligrams per cubic meter of air) is invalid under the statute because there is no substantial evidence of health need for the prescribed exposure limit, and there is no evidence to support the feasibility of that limit; (2) the Secretary has exceeded his statutory power by combining a performance standard with specific required engineering and work practice controls and by requiring the coke manufacturers to conduct open-ended research to develop additional control technology, if necessary, to achieve the permissible exposure limit; and (3) there is no substantial evidence to support the need for the specified various mandated controls and procedures[3] such as quarterly monitoring of employee expo-

[3] Petitioners also contend that the Secretary failed to comply with minimum requirements of due process for rulemaking by not providing adequate notice of the standard. Our review of the record reveals no support for this contention.

Petitioner C F & I Steel Corporation asserts that the Secretary acted capriciously in adopting a nationwide coke oven standard without considering evidence that environmental co-factors in Colorado shield C F & I's workers from the carcinogenicity of coke oven emissions. We are not persuaded by this argument. The study upon which C F & I relied was based upon the health statistics of 470 employees, while the studies upon which the Secretary relied were based on approximately 59,000 and 35,000 employees. The vastly superior statistical significance of those studies provides a rational basis for the Secretary to disregard the C F & I study.

Finally, Republic Steel Corporation argued in its brief that respirators should be used in an effort to comply with the permissible exposure limit. The Secretary's brief conceded that respirators, although not a first choice measure for reducing employees' exposure, could be used until engineering controls and work practices were fully implemented, or where those controls could not reduce exposure to the prescribed limit. In light of that concession, we need not reach that argument.

sure, prescribed protective clothing and hygiene facilities, the extent of the area to be regulated, engineering controls, and work practices.

I.

BACKGROUND

Coke is utilized primarily by steel producing companies as a fuel in blast furnaces and foundries. It is the product of the destructive distillation of coal usually produced by heating coal in an inert atmosphere in a coke oven battery.

A coke oven battery is a huge rectangular structure, typically 200 or more feet long, 40 to 60 feet wide, and up to 50 feet in height. The battery is subdivided by refractory brick walls into a series of narrow ovens, approximately 18 inches wide and 13 to 20 feet high extending the full width of the battery. Between each oven are heating flues that burn gas derived from the coal to maintain high temperatures. This heating process causes the carbonization of the coal, resulting in the formation of the coke, a pourous cellular substance, and various volatile gases. Each oven is provided with three or four charging holes in its roof through which coal is dropped into the oven, and two doors, one at each end of the oven, which are removed at the end of the coking cycle so that the incandescent coke can be pushed from the oven into the quench car. As the coal is coked, a considerable amount of gas generates. Almost all of it is captured and burned in the heating flues of the coke oven battery. This gas is removed from each oven through one or two vertical ducts, called stand pipes or ascension pipes, which are connected by horizontal ducts, called goosenecks, to one or two collector mains. In brief, coke production consists of three distinct operations: "charging," "coking," and "pushing."

The charging process begins by loading coal into a larry car which operates on a rail on top ("topside") of the battery. There are three or four coal hoppers or bins on the larry car for transferring coal from a coal bunker to the charging hold. After the coal is unloaded into the oven, it is levelled to create a space between the coal and the oven so the gas evolved during the coking process can collect. To minimize escape of these gases, a process called "charging on the main" has been developed. The gases are forced out of the oven by "steam jet aspiration" through a stand pipe and into a "gooseneck" for transmittal to the collecting main. During the trip through the gooseneck, the gases are sprayed with condensation, "flushing liquor," from the collecting main. Prior to charging, a lid man removes the lids on the charging holes of the empty oven. The larry car operator then positions the car over the empty oven and he and the lid man then let the coal out of a hopper into the oven.

The second operation in the coking process is the heating of the ovens. The ovens are heated from 14 to 36 hours at temperatures of 2000° F. or more. After the heating is completed at the end of the coking cycle, the coke is ready for the third operation, the removal ("pushing") from the oven. A pusher machine on which is mounted a mechanical ram for pushing the coal from the oven is stationed in front of the oven's "push side door." The door is removed as is the door on the oven's opposite side, the "coke side door." The ram forces the coke out of the oven through the coke side door into a railroad car, the "quench car." The quench car carries the hot coke to the "quench tower" where it is cooled with water and then dumped onto the "coke wharf." Finally, it is then conveyed to the screening stations for sizing. It is then ready for use.

The hazards to coke oven employees stem from the escape of volatile gas byproducts, a danger present at all

three stages of the coking process. The composition of the gas from the coke oven varies with the type of coal, its moisture content, and the extent to which the coal has been coked. The gas contains numerous hydrocarbons and at varying times also includes particulate matter and tars. Emissions can leak out into the work place areas immediately adjacent to the ovens through the charging hole during the charging process. Because coke oven batteries are operated at extremely high temperatures and are subject to considerable thermal stress which often produces minute cracks in coke ovens, gas can leak from the ovens during the coking process. Emissions also can leak through the oven doors during the push, and from the quench car while the coke is carried to the quench tower. Finally, if for some reason the coal has not been thoroughly coked by the time it is pushed, the uncoked coal will precipitate a "green push" generating substantial gas emissions and characterized by flames shooting out of the coke mass with dense black smoke enveloping the entire area of the battery.

Efforts to reduce employee exposure to coke oven emissions began officially in 1969. The Secretary of Labor, acting under the authority of the Walsh-Healey Act, 41 U.S.C. §§ 35-45 (1970), adopted a 1967 recommendation of the American Conference of Governmental Industrial Hygienists that occupational exposures to "coal tar pitch volatiles" ("CTPV") be limited to 0.2 mg/m^3 on an eight hour day.[4] In 1971, the Secretary adopted that standard as an "established federal standard" pursuant to section 6(c) of the Act, 29 U.S.C. § 655(a) (1970). Later that same year, the American Iron and Steel Institute

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[4] "Coal tar pitch volatiles" is a generic term and refers to organic material present on particulate matter. Because benzene is a solvent for such material, CTPV are in practice measured as the benzene-soluble fraction of the total particulate matter ("BSFTPM") found in any environment.

("AISI") petitioned the Secretary to develop a standard designed specifically for coking operations, while the United Steelworkers of America petitioned the Secretary to formulate a more stringent performance standard. The petitions were both denied, pending expedited research conducted by the National Institute for Occupational Safety and Health ("NIOSH") in the development of criteria for an appropriate standard.

The NIOSH report was issued in February 1973 and, in essence, concluded that: (1) because existing data was inadequate to determine safe coke oven emission levels, the existing 0.2 mg/m³ coal tar pitch volatile standard should be retained; (2) application of feasible engineering controls and work practices were the most efficient means to control emission leakage.

In August 1974, the Secretary established a Standards Advisory Committee on Coke Oven Emissions to review the NIOSH criteria report and to prepare recommendations for a new standard protecting employees from exposure to coke oven emissions—as distinct from other material falling within the broad coal tar pitch volatile category. Members of the committee, experts in their respective fields, included among their number an epidemiologist, a public health expert, industrial hygienists representing the employers, and union members. After lengthy hearing, on-site inspections, and review of documents, the Advisory Committee submitted a majority and dissenting 3500 page report in May 1975. Drawing upon the various studies before him, the Secretary published on July 24, 1975, his own "Proposed Standard" for coke oven emissions. He set the proposed exposure limit at 0.3 mg of respirable particulate matter ("RPM") per cubic meter of air. The area to be regulated included any coke plant area where the permissible exposure limit was exceeded. Furthermore, the proposed standard identified various engineering controls and work practices which

seemed effective in curtailing emissions exposure although such controls and procedures were not mandated under the proposed standard. OSHA conducted hearings on the proposed standard between November 1975 and May 1976 with respect to all issues.

The final standard was promulgated in October 1976. As we noted earlier, it establishes a permissible exposure limit to the benzene-soluble fraction of total particulate matter (BSFTPM) of 0.15 mg/m³. The regulated area covers the coke oven batteries, topside, push side, and coke side, with their attendant machinery, the battery ends, the quenching tower, wharf and screening station. Quarterly monitoring of exposure levels for each shift in each job classification in the regulated area is also provided. To reach the permissible limits, an extensive list of engineering and work practices to be implemented at each battery is ordered. Finally, the standard provides that if the permissible exposure limit has not been met after implementing all the specified controls, the employers must provide respiratory equipment and they must undertake open-ended research and development until they have developed technologies which will achieve compliance.

In December 1976 petitioners AISI and American Coke and Chemical Institute ("ACCI") applied to the Secretary for a stay of the effective date of certain of the standard's provisions or for alternative relief. The Secretary denied that petition in January 1977. Petitioners then moved this court for a stay. The court granted an interim stay pending decision on the motion, denied the motion on February 18, 1977, and vacated the interim stay. This petition for review, for which we have jurisdiction under section 6(f) of the Occupational Safety and Health Act of 1970, 29 U.S.C. § 655(f) (1970), followed.

We affirm the standard but vacate the sections pertaining to research and development requirements and the requirement of a qualitative fit test for respirators.

II.

THE STANDARD OF REVIEW

Our standard of review in this case is statutorily mandated by section 6(f) of the Act, 29 U.S.C. § 655(f), which provides in pertinent part:

> The determination of the Secretary shall be conclusive if supported by substantial evidence in the record considered as a whole.

In *Synthetic Organic Chemical Manufacturers* v. *Brennan*, 503 F.2d 1155 (3d Cir.) *cert. denied*, 420 U.S. 923 (1970) (*"SOCMA I"*), this court set forth a five-step process for reviewing the Secretary's safety standard under section 6(f):

(1) determine whether the Secretary's notice of proposed rulemaking adequately informs interested persons of the action taken;

(2) determine whether the Secretary's promulgation adequately sets forth reasons for his action;

(3) determine whether the statement of reasons reflects consideration of factors relevant under the statute;

(4) determine whether presently available alternatives were at least considered; and

(5) determine whether substantial evidence in the record as a whole supports the Secretary's determination, if it is based in whole or in part on factual matters subject to evidentiary development. *Id.* at 1160.

As is typical in the mutifaceted character of judicial review of legislative standards resulting from informal

rulemaking, we are concerned with intricate questions pertaining to fact-finding, policy making, and statutory construction. The framework around which we must build our decision involves an examination of scientific facts, economic considerations and statutory markings. Underlying our approach to the questions presented is, of course, a recognition of the congressional mandate to protect the health of industrial employees and to weigh the burdens of an important but currently beleaguered industry.

As we examine the regulation at issue in this case, it is imperative to distinguish between determinations bottomed on factual matters, and non-factual, legislative-like policy decisions. It is only the former that we subject to the "substantial evidence" test. The evidence in support of a fact-finding is "substantial" when "from it [the evidence] an inference of the fact may be drawn reasonably." B. Schwartz, *Administrative Law* 595 (1977). In such a case, the reviewing court must uphold the finding "even though [it] would justifiably have made a different choice had the matter been before it de novo." *Palmer* v. *Celebrezze*, 334 F.2d 306 (3d Cir. 1964), *quoting Universal Camera Corp.* v. *Labor Board*, 340 U.S. 474, 488 (1950).

III.

THE VALIDITY OF THE PERMISSIBLE EXPOSURE LIMIT OF 0.15 MG/M³ BSFTPM

In determining the validity of an exposure limit of 0.15 mg/m³ BSFTPM, two major questions must be addressed: Is there substantial evidence supporting the conclusion that the ambient atmosphere of a coke oven contains particulate matter to which there is no safe level of exposure? Is the Secretary's limit feasible as required by section 6(b)(5)? We will discuss each of these questions in turn.

A. Carcinogenicity and safe exposure levels

The record in this case supports the Secretary's findings, never disputed by any of the parties,[5] that there is substantial evidence that coke oven emissions are carcinogenic. Dr. Eula Bingham, then associate professor of environmental health at the University of Cincinnati's Medical School and chairman of the Secretary's Advisory Committee (now Assistant Secretary of Labor for OSHA), concluded unequivocally in her testimony before OSHA that "there is overwhelming scientific evidence that coke oven emissions are carcinogenic," and hence, "the ambient atmosphere of coke ovens is a carcinogen rich environment."

Evidence of carcinogenicity has been derived from chemical analysis and various epidemiological studies. Such studies indicate a significantly higher rate of mortality among coke oven workers than the general population. For example, the rate of mortality for lung cancer among employees working on top of the coke oven batteries for five or more years is ten times greater than normal. Furthermore, the incidence of contracting various non-malignant respiratory diseases—bronchitis, emphysema, pneumoconiosis—is also substantially increased, particularly for long term workers.

Having established the existence of a health hazard created by coke oven emissions, the Secretary endeavored to ascertain a safe level of exposure. Edward Baier, Deputy Director of NIOSH, testified in hearings that it is impossible to set a safe threshold exposure limit above zero for a carcinogen. In a 1970 report to the Surgeon General entitled "Evaluation of Environmental Carcino-

[5] For example, the senior environmental chemist and toxicologist for Bethlehem Steel stated at the hearings that coke oven emissions were "a cause" of observed excess incidents of lung cancer among coke oven employees.

gens" the Ad Hoc Committee on the Evaluation of Low Levels of Environmental Chemical Carcinogens stated, "no level of exposure to a chemical carcinogen should be considered toxicologically insignificant for man. For carcinogenic agents a safe level for man cannot be established by application of our present knowledge. The concept of 'socially acceptable risk' represents a more realistic notion." The Ad Hoc Committee's report substantially summarizes the opinions of numerous experts that there were no known safe exposure levels at the time to carcinogens. Finally, the majority report of the Secretary's Advisory Committee based its recommendations to the Secretary on the finding that "coke oven emissions are carcinogenic and there is no scientific data to demonstrate that there is a safe level of exposure to carcinogens . . . ."[6]

The Secretary's factual determination that coke oven emissions are carcinogenic and that there is no absolutely safe level of exposure to them is supported by substantial evidence in the record. Therefore, we have no difficulty in concluding that the Secretary's effort to meet a perceived health need by establishing an exposure limit to coke oven emissions was proper. The proprieties of

[6] In discussing the permissible exposure limit, the report in pertinent part states:

> Experimental data suggest that cocarcinogenic agents may play a critical role in the development of lung cancer. In addition, epidemiological evidence indicates that certain environmental cofactors may potentiate the risk of developing lung cancer. Experimental data and epidemiological evidence provide important clues as to the specific roles of the multiple chemical agents and physical stresses in the complex environment of coke ovens which result in the development of cancer.
>
> * * *
>
> Since coke oven emissions *are carcinogenic* and there is no scientific data to demonstrate that there is a safe level of exposure to carcinogens, the basis of this standard must be *"no exposure."* (Emphasis supplied.)

setting the limit to 0.15 mg/m³ BSFTPM, however, presents greater difficulties.[7]

B. Feasibility of the standard

Section 6(b)(5) of the Act requires, *inter alia*, that the Secretary "shall set the standard which most adequately assures, to the extent feasible, on the basis of best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard . . . for the period of his working life." 29 U.S.C. § 655(b)(5) (1970). In attempting to formulate the lowest possible exposure limit, the Secretary is constrained by the requirement of feasibility, both technological and economic. *American Federation of Labor* v. *Brennan*, 530 F.2d 109, 122 (3d Cir. 1975). We will now examine each aspect of the feasibility requirement.

(1) Technological feasibility

The Secretary set the exposure limit at 0.15 mg/m³ BSFTPM relying primarily on NIOSH tests conducted at U.S. Steel's Fairfield, Alabama plant—considered the most modern and clean coke oven battery operating in the United States. Fifty measurements were taken at various job positions around the battery over a three-day period. The NIOSH data showed that exposure levels were below the 0.15 mg/m³ BSFTPM level on at least one of the days for each job classification tested. Although those low-level readings constituted only one-third of the total

[7] A level of zero exposure could not be set because there is some naturally occurring background presence of the measured substance in the air which cannot be removed from the environment. Because benzopyrene ("BAP") was one of the most potent components of coke oven emissions and largely responsible for their carcinogenic potency and is to some extent ubiquitous in the environment, the Committee tailored its recommendation from zero to 0.02 ug (micrograms) /m³.

samples taken, the Secretary noted that the Fairfield battery had not implemented all of the specific engineering controls that are now required in the standard. In view of this data, along with data from other batteries, in particular the Bethlehem Steel coke battery in Johnstown, Pennsylvania, where exposure in one job classification dropped from 6.4 mg/m³ to 0.38 mg/m³ after new engineering controls were implemented, and testimony concerning new alternative coke production techniques and emission controls, the Secretary concluded that the prescribed standard was technologically feasible. To account for initial difficulties, the standard mandates that while these controls are being implemented, or where the standard is, for some reason, not technologically feasible, then the health needs of coke oven employees require use of respirators wherever the exposure limit is exceeded.

The petitioners advance several arguments supporting their contention that the prescribed exposure limit is not feasible. First, petitioners attack the Secretary's reliance on the NIOSH test at the Fairfield batteries. Petitioners suggest that if the measurements taken at the newest, cleanest batteries indicate that the limit can be met only one-third of the time, then not only would it be difficult for the best batteries to meet the prescribed limits, but it would be next to impossible for the older batteries to meet it. Petitioners also contest the validity of the data on which the Secretary relies. Coke oven batteries are subject to different temperatures, wind, and humidity, depending on their geographical location and seasonal changes. Petitioners argue that the Fairfield data, measuring exposure in one location and over only three consecutive days, could not possibly yield an accurate representation of the exposure levels at Fairfield, let alone at batteries across the country under materially different climactic conditions. Finally, petitioners note that there is no evidence substantiating

the Secretary's faith in new and innovative controls and production techniques "looming over the horizon" to reduce emission levels. Expert testimony disclosed that major new developments in coke production require a minimum of ten years to implement. Petitioners argue that section 6(b)(5) requires *actual* technological feasibility, not a standard that might be attained through developments now unforeseeable.

Our review of the extensive record indicates that the substance of the petitioners' argument may be substantially sound but not necessarily the conclusions they draw. The Secretary's decision to establish a 0.15 mg/m^3 exposure level, based on the evidence that coke oven emissions are carcinogenic at any level of exposure—a finding which the record substantially supports—was a policy judgment on the basis of the best available evidence as to what the industry could achieve in an effort to best protect its coke oven employees. This decision is not a factual determination for which we need find substantial evidence in the record to support. Under the Act, the Secretary's task combines elements of legislative policy determinations and fact finding. *Industrial Union Department AFL-CIO* v. *Hodgson*, 499 F.2d 467, 476 (D.C. Cir. 1974). In this instance, his ultimate determination of the appropriate exposure level is a legislative decision in the exercise of congressionally delegated powers. Even though we might have drawn different inferences from the information before the Secretary, his conclusion was reasonably drawn from the record and, therefore, it must be upheld.

Our role in reviewing this exposure limit [8] has been defined in two cases in two different circuits, *Society of Plastics Industry, Inc.* v. *OSHA*, 509 F.2d 1301 (2d

[8] For an enlightening discussion of the problems judges face in reviewing technical standards, *see* Judge Oakes' article, *The Judicial Role in Environmental Law*, 52 N.Y.U. L. Rev. 498 (1977).

Cir.), *cert. denied*, 421 U.S. 992 (1975), and *Industrial Union Department, AFL-CIO* v. *Hodgson*, 499 F.2d 467 (D.C. Cir. 1974). In *Hodgson* the D.C. Circuit reviewed the Secretary's standards regulating the atmospheric concentrations of asbestos dust in industrial work places. In that case, as in this, the Secretary made his factual determinations by analyzing often conflicting data and drawing conclusions from it: reading the record to find support for such conclusions was the proper reviewing function. *Id.* at 474. But there, as here:

> The Secretary was obligated to establish some specific level as the maximum permissible exposure. After considering all the conflicting evidence, the Secretary explained the decision to adopt, over strong employer objection, a relatively low limit in terms of the severe health consequences which could result from overexposure. Inasmuch as the protection of the health of employees is the overriding concern of OSHA, this choice is doubtless good, but it rests in the final analysis on an essentially legislative policy judgment rather than a factual determination . . . .

Id. at 475. The court concluded that because "judicial review [of legislative-like decisions] inevitably runs the risk of becoming arbitrary supervision and revision of the Secretary's efforts to effectuate the legislative purposes in an area where various responses might each be legitimate in the sight of congress," *Id.* at 448, it would remand only those provisions of the standard which left "nagging questions . . . as to the reason and rationale for the Secretary's particular choices." *Id.*

This line of analysis was followed in *Society of Plastics, supra.* In that case, the Second Circuit reviewed industry's challenge to the Secretary's standard governing employees' exposure to vinyl chloride emissions. The

Secretary had established a permissible exposure level of one part per million (1 ppm) of vinyl chloride over an eight-hour period, to be achieved primarily through "feasible engineering and work practice controls," *id.* at 1307, or through the use of respirators where the 1 ppm level could not be reached. *Id.* Even though no plant had been able to reach the 1 ppm level by the time of the adjudication, Justice Clark, sitting by designation, upheld the standard as reasoned decision making, writing:

> We cannot agree with petitioners that the standard is so clearly impossible of attainment. It appears that they simply need more faith in their own technological potentialities, since the record reveals that, despite similar predictions of impossibility regarding the emergency 50 ppm standard, vast improvements were made in a matter of weeks, and a variety of useful engineering and work practice controls have yet to be instituted.

Id. at 1309. As in *Society of Plastics, supra,* the record here reveals that the coke oven industry also could with some self-confidence and determination develop "their own technological potentialities," and achieve a variety of improvements. The experience at the Fairfield and Bethlehem Steel batteries provides a sufficient basis for the Secretary's reasoned belief that the 0.15 mg/m³ limit could be met.

The Fairfield plant had been extensively rehabilitated to include considerable, but not all, effective emission control technology, and its personnel had been trained in abatement and operating procedures. NIOSH and U.S. Steel simultaneously monitored the plant over a three-day period in seven different job classifications. More than half of the 43 results reported did not exceed the existing standard of 0.2 mg/m³ and the NIOSH data disclosed that exposure levels in every job classification monitored were below 0.15 mg/m³ of the BSFTPM on at least one of the

three sampling days. Three job classifications were below this level on more than one day and another three measured "no detectable levels" in the monitoring samples for that day. U.S. Steel's results also revealed levels below 0.15 mg/m³ BSFTPM in every sampled job classification on at least one testing day and all but two classifications met this level on more than one day. NIOSH also monitored worker exposure in five other coke plants for two one-week periods and each of these plants reached levels below 0.15 mg/m³ BSFTPM for both rounds of personal sampling. Although this data was reported by coke plants rather than job classification, other monitoring results show exposure levels below 0.15 mg/m³ for almost all job positions at plants other than Fairfield. Data submitted by Republic Steel, C F & I, and Koppers St. Paul, Minnesota, plants also demonstrate an ability to achieve levels below 0.15 mg/m³ for numerous classifications.[8] Of course, many samples were recorded above these levels but the evidence supports the Secretary's conclusion that the 0.15 mg/m³ levels could be reached, particularly with a motivated program to attain it and the application of the recommended engineering controls and practices.[9] Furthermore, many persons testified to innovative technology currently in the experimental stage readily adaptable to old batteries.

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[8] In developing a record on which the agency could confidently evaluate the standards' feasibility, the Secretary contracted with a consulting firm to analyze the ability of the coking industry to comply. The analysis relied on raw data collected from coke producers, their suppliers, industry trade associations, labor unions, and government agencies. It concluded that the pertinent proposed engineering controls were technologically feasible.

[9] An illustration of the technological feasibility of the standard is Bethlehem Steel's experience in reducing emission levels at its Johnstown plant. A drastic drop in emission concentration in larry car cabs from an average of 3.0 to 0.09 mg/m³ was accomplished by filtering air in the cabs and exercising other controls and work practices. The mere filtering of air in the larry car cabs was sufficient to reduce the level from 0.71 to 0.10 mg/m³.

As this court noted in *Atlantic & Gulf Stevedores* v. *OSHA*, 534 F.2d 541 (3d Cir. 1976), "it may become evident that a particular safety and health standard is economically or technologically infeasible, or otherwise unreasonable, only after employees have made a good faith effort to comply." *Id.* at 550. Finally, if the exposure limit cannot be met at a certain battery, even after the engineering controls and work practices variance are implemented, section 6(d) prudently sets up certain procedures for obtaining a variance from a standard.[10]

We believe the Secretary has made, at least, a reasoned decision in setting the exposure limit at 0.15 mg/m³ and we have no "nagging question" about the rationale supporting his choice. Therefore, we hold that the prescribed limits meet the technological feasibility requirement of section 6(b)(5).

(2) Economic feasibility

In the effort to safeguard the health and safety of employees in the industrial establishments throughout the land, there is nonetheless a very practical necessity to weigh economic costs. Congress did not intend to eliminate all health hazards to industrial employees at the price of crippling an industry or rendering it extinct. The role economic considerations are to play in review of the Secretary's standard was enunciated in *Industrial Union Department AFL-CIO* v. *Hodgson, supra,* at 477-78, and adopted for this circuit by Judge Gibbons in *American Federation of Labor* v. *Brennan, supra,* at 122-23. In *Hodgson* Judge McGowan stated:

> There can be no question that OSHA represents a decision [by Congress] to require safeguards for the

[10] 29 U.S.C. § 655(d) (1970) provides in pertinent part:

> An affected employer may apply to the Secretary for a rule or order for a variance from a standard promulgated under this section.

health of employees even if such measures substantially increase production costs . . . . [B]ut practical considerations can temper protective requirements. Congress does not appear to have intended to protect employees by putting their employers out of business—either by requiring protection devices unavailable under existing technology or by making financial viability generally impossible . . . .

Standards may be economically feasible even though, from the standpoint of employers, they are financially burdensome and affect profit margins adversely. Nor does the concept of economic feasibility necessarily guarantee the continued existence of individual employers. It would appear to be consistent with the purposes of the Act to envisage the economic demise of an employer who has lagged behind the rest of the industry in protecting the health and safety of employees and is consequently financially unable to comply with new standards as quickly as other employers.

To develop a record on which the Secretary could confidently evaluate the standard's feasibility, the Department of Labor contracted with a consulting firm to analyze the coke industry's financial ability to comply with the proposed standard. This material was developed by a team of economists from the University of Utah. In addition, the Secretary was able to draw on an economic study commissioned by the AISI to determine the financial impact of the proposed standard.

These studies indicate that the standard would have an adverse impact on the coke oven industry. Estimates of the total annual cost to industry of compliance range from $240,000,000 to $1,280,000,000[11] including capital and

[11] Counsel for Republic Steel stated in oral argument that industry accepts the $240,000,000 figure.

operating and maintenance costs. Petitioners note that loss of coke production resulting from allocation of resources to meet the standards would add $980,000,000 to the direct cost. The studies also indicate that an additional 10 million man-hours would be required to meet the standard. From a consumer's perspective, the cost of steel, according to the study, would likely rise about one-half of one percent.

These annual costs, petitioners contend, will inflict a severe blow to an industry already heavily burdened by financial pressures and aggressive competition from foreign producers. AISI's study found that between 1976 and 1983, the coke industry will require 39.3 billion dollars in overall capital financing, of which as much as 23 billion dollars must be externally financed. The ultimate impact of an additional financial burden might well be a cutback on expansion of the steel industry and, consequently, an increase of imported steel. Petitioners further note that OSHA's inflationary impact statement indicated that earnings per share in the industry would decline approximately 13 percent.

The Secretary was well aware of the costs to the coke and steel industry the emissions standard would generate. But the Secretary noted that record evidence demonstrated that the steel industry has been stable and profitable, with after tax earnings of seven major and five smaller steel producers exceeding $857 million per year. Furthermore, the Secretary noted the absence of any testimony from the industry spokesmen that the standard would imperil the existence of the coke industry as an affirmation of the healthy state of the industry. 41 Fed. Reg. 46748.

Although we are very sensitive to the financial implications of the standard and have endeavored to carefully weigh its effect upon the well-being of the industry, we are not persuaded that its implementation would precipitate approaching the "massive dislocation," *American*

Federation of Labor v. *Brennan, supra,* at 123, which would characterize an economically infeasible standard. The Secretary had sufficient data from which he could properly balance the cost to industry against the health needs of its employees. The Secretary concluded:

> [C]ompliance with the standard (even if the higher cost estimate were used) is well within the financial capability of the coking industry. Moreover, although we cannot rationally quantify in dollars the benefit of the standard, careful consideration has been given to the question of whether these substantial costs are justified in the light of the hazards. OSHA concludes that these costs are necessary in order to adequately protect employees from the hazards associated with coke oven emissions.

41 Fed. Reg. 46751.

We find no basis to conclude the Secretary has not fulfilled his duty to inquire into the economic feasibility of the standard, nor are we persuaded that the standard is, in fact, infeasible. We also attach significance to the United Steelworkers' strong support of the standard. If the standard turns out in reality to be economically infeasible, their members will perhaps suffer as much, if not more than, any other interested party. Accordingly, we hold that the permissible exposure limit of 0.15 mg/m^3 BSFTPM also meets the economic feasibility requirement of section 6(b)(5).

IV.

THE POWER OF THE SECRETARY TO COMBINE A PERFORMANCE STANDARD WITH MANDATED CONTROLS AND PROCEDURES AND TO REQUIRE RESEARCH AND DEVELOPMENT

A. Performance standard combined with controls and procedures

Petitioners contend that combining a performance standard with mandatory controls and procedures exceeds the Secretary's power. In support of their attack on this "double-barrelled" standard, petitioners point to the statutory grant of power, section 6(b)(5), which states "whenever practicable, the standard promulgated shall be expressed in terms of objective criteria and of the performance desired." 29 U.S.C. § 655(b)(5) (1970). Then, petitioners point to section 6(b)(7) which states: "where appropriate, such standard shall also prescribe . . . control of technological procedures." 29 U.S.C. § 655(b)(7) (1970). Petitioners argue that when a performance standard has been adopted under section 6(b)(5) the additional imposition of specific engineering controls under section 6(b)(7) to achieve that level is clearly not "appropriate" because "[s]etting forth inflexible requirements of particular methods would be effective only if the Secretary could anticipate all possible problems and devise a uniform approach appropriate to each." *Industrial Union Department* v. *Hodgson, supra,* at 484. Furthermore, petitioners note that the Secretary rejected imposition of specific controls in the proposed rules. Petitioners argue that because the record contains no evidence to rebut that prior conclusion, and because the standard makes no effort to explain the change, the Secretary is foreclosed from requiring industry to apply controls he had previously rejected. *SOCMA I, supra,* at 1160.

Petitioners' contention as to the propriety of the "double-barrelled standard" is devoid of support. First, section 6(b)(5) authorizes the Secretary to set "the standard which most adequately assures . . . that no employee will suffer material impairment of health." 29 U.S.C. § 655(d)(5) (1970). We discern nothing in the language cited by petitioners in sections 6(b)(5) and (7) to indicate lack of power to combine a performance standard with controls and procedures. Second, petitioners' reliance on the language from *Hodgson* is misleading for while the court approved non-mandatory controls for certain aspects of a plan to reduce asbestos concentrations, the decision did uphold a standard in which the Secretary combined a maximum permissible exposure level with certain required work practices. 499 F.2d at 483. Third, because the statutory objective is to adequately assure that employees will not suffer material impairment of health while at work, it becomes self-defeating to bar the use of reasonable and effective engineering controls and work practices to achieve such purpose.

Furthermore, we disagree with petitioners' contention that the Secretary failed to explain his policy reversal in requiring work practices and engineering controls. At 41 Fed. Reg. 46760 the Secretary stated:

> [T]he final rule, unlike the proposal requires specific minimum engineering and work practice controls for byproduct coke ovens, which constitute about 99% of the coking industry. OSHA believes this approach is appropriate because (1) while there are some differences among the 65 coke oven plants with 236 coke oven batteries, their design and operation are similar; and (2) much of the technology which is required by the final rule has been available for some time . . . . [W]e are confident that as described more fully below the specified controls will signifi-

cantly reduce employee exposures and that these controls represent minimum controls which are necessary to protect employee health.

Based on the record developed in the informal rulemaking proceedings, including the advisory committee, the agency has determined that the engineering controls and work practices specified below are the essential minimum constituents of an effective emission control program and that they are technologically feasible on nearly all of the existing coke oven batteries.

We believe the Secretary's policy decision to require implementation of work practices and engineering controls in combination with a performance standard is supported by the record and that discussion of the requirement in the standard meets the *SOCMA I* test of supplying a reasoned analysis reflecting considerations of relevant factors.

B. Required research and development

The Secretary's standard requires that if, after implementation of all the required controls, the permissible exposure limit has not been met by January 20, 1980,

> employers shall research, develop and implement any other engineering and work practice controls necessary to reduce exposure to or below the permissible exposure limit . . . .

41 Fed. Reg. 46785.

Petitioners attack this requirement contending that requiring employers to engage in unlimited research and development is not authorized by the Act. Although the Secretary may "raise standards which require improvement in existing technologies or which require the development of new technology," *Society of Plastics In-*

dustry, Inc. v. *OSHA*, *supra*, at 1309, petitioners note that the Secretary's technology-forcing power is limited to technology that "looms on today's horizon." *American Federation of Labor* v. *Brennan*, *supra*, 530 F.2d at 131. The petitioners also contend that the requirement is fatally vague, providing no indication of the limit or magnitude of the employer's obligation. The Government maintains that the requirement is valid "technology-forcing" and that it is not fatally vague.

29 U.S.C. § 665(b)(5) grants authority to the Secretary to develop and promulgate standards dealing with toxic materials or harmful agents "based upon research, demonstrations, experiments, and such other information as may be appropriate." Under the same statutory provision the Secretary is directed to consider the latest scientific data in the field. As we have construed the statute, the Secretary can impose a standard which requires an employer to implement technology "looming on today's horizon," and is not limited to issuing a standard solely based upon technology that is fully developed today. Nevertheless, the statute does not permit the Secretary to place an affirmative duty on each employer to research and develop new technology. Moreover, the speculative nature of the research and development provisions renders any assessment of feasibility practically impossible. In holding that the Secretary lacks statutory authorization to promulgate the research and development provision, we note in passing that we need not reach petitioners' challenge to the provision as fatally vague. Accordingly, we hold the research and development provision of the standard to be invalid and unenforceable.

V.

THERE IS SUBSTANTIAL EVIDENCE IN THE RECORD TO SUPPORT THE VARIOUS MANDATED CONTROLS AND PROCEDURES

Conceding the usefulness and record support of many of the Secretary's mandated controls and procedures, petitioners nevertheless contend that several of them are wholly without support in the record. In particular, they point to: (1) the frequency of monitoring, (2) the protective clothing and hygiene facilities and practices, (3) the regulated area definition, (4) the requirement to employ the following engineering controls and work practices: (a) cleaning of flues and related equipment at least weekly, (b) mechanized gooseneck and stand pipe cleaners, (c) inspection of gooseneck and stand pipes, oven roofs, steam aspiration systems, and steam nozzles and liquor sprays before each charge, (d) filtered air to door machine cabs. Furthermore, petitioners contend that as to the inspection, cleaning, and maintenance provisions, the Secretary did not request information on all possible problems that might be encountered with such provisions, and hence, they must fail.

Petitioners also challenge the requirements of a quantitative fit test for respirators. The Government's brief conceded that the provision was unsupported and indicated that it would not be enforced. In light of that concession, we strike down that provision.

Having searched the record thoroughly, we find sufficient basis to uphold the Secretary's mandated controls and procedures. Although our review indicates that one or more of the controls may not be practicable at some of the batteries, we note that the controls are mandated

"except to the extent that the employer can establish that such controls are not feasible." 41 Fed. Reg. 46785.[12]

Finally, petitioners' argument that the inspection, cleaning, and mainten nce provisions do not fall within the scope of the proposed standards is without merit. Petitioners are correct that the proposed rule did not request information as to all possible problems that might be encountered with such provision. But the proposed rule did state:

> On the basis of the record, compiled by the advisory committee and OSHA's current compliance activity under the existing standard, it is apparent that it is technologically feasible to reduce employee exposure to or below the permissible exposure limit through the implementation of engineering, work practice, and personal protective controls. Information is requested as part of the proceeding as to the feasibility of reaching the permissible exposure limit solely through the use of engineering controls and supplementary work practices including the question of retrofitting existing coke oven batteries with new technology. In addition, information is sought as to any specific difficulties associated with the supplementary work practices and personal protective con-

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[12] Petitioners contend that the burden of proof to establish the need for a section 6(d) variance, 29 C.F.R. § 1905.11(b)(4), is virtually impossible to carry. The regulation reads in pertinent part:

> An application [for a variance] . . . shall include: (4) a statement showing how the conditions, practices, means, methods, operations, or processes used or proposed to be used would provide employment and places of employment to employees which are as safe and healthful as those required by the standard from which a variance is sought.

Considering the Secretary's mandated concern for the health of industrial employees, we do not find this burden of proof for a variance from a proper OSHA health standard to be unreasonable or imposing an undue hardship.

trols which might affect the feasibility of reducing exposure to the permissible exposure limit.

In the preceding paragraph the proposed rule stated:

> In order to provide some information and guidance as to the technology currently available and its application to existing and rehabilitated or new batteries, a list of some engineering controls and work practices is included as appendix B to the standard. 40 Fed. Reg. 32273.

Appendix B listed the engineering controls and work practices, now part of the standard, that the Secretary felt would be effective in controlling coke oven emissions. 40 Fed. Reg. 32281-82. We believe this gave petitioners sufficient notice of the controls and procedures ultimately required in the standard.

VI.

INCLUSION OF NON-COKE OVEN EMPLOYERS WITHIN THE SCOPE OF THE STANDARD

Petitioners contend that because the proposed standard afforded no notice to non-coke oven employees that they would be covered by the standard, the Secretary failed to comply with minimum requirements of due process. Petitioners assert that there was no explanation why independent contractors, who repair, maintain or otherwise service the batteries, were included within the standard, that there was no consideration of alternative measures designed exclusively for independent contractors, and that there was no consideration of the feasibility of applying the standards to independent contractors. Petitioners therefore conclude that inclusion of non-coke oven employers in the standard's coverage runs afoul of the *SOCMA I* test for upholding the Secretary's standard.

We are not wholly persuaded by this argument. From a purely practical perspective, it would make little sense to apply a health standard to only one group of employees; employees of independent contractors suffer the effects of carcinogens as well. To protect maintenance and repair workers, the standard provides that compliance with the exposure limit may be achieved using only respirators "in work operations such as maintenance and repair activity in which engineering and work practice controls are technologically not feasible. 41 Fed. Reg. 46787. We read this provision as applicable to and intended for independent contractors.

In the proposed standard, submission of written consents, data, and arguments were requested from "any interested party." 40 Fed. Reg. 32268. Moreover, the proposed standard stated that coverage was to extend to "employee exposure" to coke oven emissions, without in any way limiting that coverage to coke-oven employees. 40 Fed. Reg. 32273. In a matter of such vital importance, however, we find it difficult to conclude that the notice given to the coke producers constituted notice of the proposed standards to the non-coke-oven employers.

We recognize that there are serious problems unique to those independent contractors engaged in the construction, maintenance, and repair of coke oven batteries. In this petition, filed by coke producers to review the feasibility of these regulations, the independent contractors have not even filed an amicus brief. Because we are well aware of the adverse impact full application of the standard to independent contractors might entail, and because the standard does not specifically address the particular problems faced by independent contractors, we have serious reservations concerning the broad construction of the standard's applicability to independent contractors contained in the March 3, 1977, letters by the Acting Assistant Secretary of Labor, Bert Concklin

(App. 6519). The petition for review, therefore, insofar as it applies to the non-coke-oven employers will be remanded for further proceedings not inconsistent with this opinion.

VII.

CONCLUSION

Accordingly, the petitions for review will be denied and the Secretary's coke oven emissions standard affirmed except: (1) insofar as the Secretary requires the petitioners to research and develop any other engineering and work practice controls necessary to reduce exposure to or below the permissible exposure limit, 29 C.F.R. § 1910.1029f(1)(i)(b), f(1)(ii)(b), f(1)(iii)(b), (f)(6)(iii)), (2) the provision relating to the requirement of a quantitative fit test for respirators. 29 C.F.R. § 1910.1029(g)(4)(i)), and (3) application of the standard to non-coke-oven employers. As to the first two mentioned requirements, the applicable sections of the coke oven emissions standard will be vacated, and as to the last requirement, we remand for further proceedings consistent with this opinion.

Each party to bear its own costs.

TO THE CLERK:

Please file the foregoing opinion.

/s/ Max Rosenn
Circuit Judge

APPENDIX B

UNITED STATES COURT OF APPEALS FOR THE THIRD CIRCUIT

Nos. 76-2358, 76-2359, 76-2424, 76-2371, 76-2372, 76-2629, 76-2630, 77-1016, 77-1025, 77-1088

Re: AMERICAN IRON AND STEEL INSTITUTE
1000 16th Street, N.W.
Washington, D.C. 20036

JONES & LAUGHLIN STEEL CORPORATION
3 Gateway Center
Pittsburgh, Pennsylvania 15263

NATIONAL STEEL CORPORATION
2800 Grant Building
Pittsburgh, Pennsylvania 15219

SHARON STEEL CORPORATION
P.O. Box 291
Sharon, Pennsylvania 16146

SHENANGO INCORPORATED
P.O. Box 3030
Pittsburgh, Pennsylvania 15230

UNITED STATES STEEL CORPORATION
600 Grant Street
Pittsburgh, Pennsylvania 15230

WHEELING-PITTSBURGH STEEL CORPORATION
P.O. Box 118
Pittsburgh, Pennsylvania 15230
Petitioners in Nos. 76-2358 and 76-2371

REPUBLIC STEEL CORPORATION,
Petitioner in Nos. 76-2359 and 76-2372

BETHLEHEM STEEL CORPORATION
Bethlehem, Pennsylvania 18016
Petitioner in No. 76-2424

ARMCO STEEL CORPORATION
703 Curtis Street
Middletown, Ohio 45043
Petitioner in No. 76-2629

CRUCIBLE MATERIALS GROUP
COLT INDUSTRIES INC.
P.O. Box 88
Pittsburgh, Pennsylvania 15230

CYCLOPS CORPORATION
650 Washington Road
Pittsburgh, Pennsylvania 15228

INLAND STEEL COMPANY
30 West Monroe Street
Chicago, Illinois 60603,
Petitioners in No. 76-2630

YOUNGSTOWN SHEET AND TUBE COMPANY,
Petitioner in No. 77-1016

AMERICAN COKE AND COAL CHEMICALS INSTITUTE
1010 16th Street, N.W.
Washington, D.C. 20036
Petitioner in No. 77-1025

C F & I STEEL CORPORATION,
Petitioner in No. 77-1088

v.

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
UNITED STATES DEPARTMENT OF LABOR
UNITED STATES OF AMERICA,
Respondent

UNITED STEELWORKERS OF AMERICA, AFL-CIO,
Intervenor

ON PETITIONS FOR REVIEW OF AN ORDER OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, UNITED STATES DEPARTMENT OF LABOR

Present: ROSENN and HIGGINBOTHAM, *Circuit Judges* and VAN ARTSDALEN, *District Judge**

AMENDED JUDGMENT

This cause came on to be heard on the certified list in lieu of the record from the Assistant Secretary of Labor for Occupational Safety and Health, United States Department of Labor, and was argued by counsel on January 5, 1978.

On consideration whereof, it is now here ordered and adjudged by this Court that the petitions for review of the Order of the Occupational Safety and Health Administration, United States Department of Labor, promulgated October 19, 1976, be, and the same are hereby denied and the Secretary's coke oven emissions standard affirmed except: (1) insofar as the Secretary requires the petitioners to research and develop (as defined in the court's opinion) any other engineering and work practice controls necessary to reduce exposure to or below the permissible exposure limit, 29 C.F.R. § 1910.1029(f)(1)(i)(b), (f)(1)(ii)(b), (f)(1)(iii)(b), and (f)(6)(iii), (2) the provision relating to the requirement of a quantitative fit test for respirators. 29 C.F.R. § 1910.1029 (g)(4)(i), and (3) application of the standard to non-coke-oven employers. As to the first two mentioned requirements, the applicable provisions of the coke oven emissions standard

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* Donald W. Van Artsdalen, United States District Judge for the Eastern District of Pennsylvania, sitting by designation.

are vacated, and as to the last requirement, the cause is remanded for further proceedings consistent with the opinion of this Court. Each party to bear its own costs.

ATTEST:

/s/ Thomas F. Quinn
Clerk

May 1, 1978

APPENDIX C

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

No. 76-2358/9, 76-2371/2, 76-2424, 76-2629/30,
77-1016, 77-1025, and 77-1088

AMERICAN IRON AND STEEL INSTITUTE, *et al.*

v.

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION,
et al.

UNITED STEELWORKERS OF AMERICA, AFL-CIO,
Intervenor

SUR PETITION FOR REHEARING

Present: SEITZ, *Chief Judge*, ALDISERT, ADAMS, GIBBONS, ROSENN, HUNTER, WEIS, GARTH, and HIGGINBOTHAM, *Circuit Judges*, and VAN ARTSDALEN, *District Judge* *

The petitions for rehearing filed by American Iron and Steel Institute, et al., and Republic Steel Corporation in the above entitled case having been submitted to the judges who participated in the decision of this court and to all other available circuit judges of the circuit in regular active service, and no judge who concurred in the decision having asked for rehearing, and a majority of the circuit judges of the circuit in regular active serv-

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* Sitting by designation.

ice not having voted for rehearing by the court en banc, the petition for rehearing is denied.

By the Court,

/s/ Max Rosenn
Judge

Dated: July 12, 1978

APPENDIX D

SUPREME COURT OF THE UNITED STATES

No. A-294

AMERICAN IRON & STEEL INSTITUTE, *et al.*,
Petitioners,

v.

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION,
et al.

ORDER EXTENDING TIME TO FILE PETITION FOR WRIT OF CERTIORARI

UPON CONSIDERATION of the application of counsel for petitioner(s),

IT IS ORDERED that the time for filing a petition for writ of certiorari in the above-entitled cause be, and the same is hereby, extended to and including December 9, 1978.

/s/ Wm. J. Brennan, Jr.
Associate Justice of the
Supreme Court of the
United States

Dated this 3 day of October, 1978.

APPENDIX E

Provisions of the Occupational Safety and Health Act:

1. Section 3(8) (29 U.S.C. § 652(8)):

> (8) The term "occupational safety and health standard" means a standard which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment.

2. Section 5 (29 U.S.C. § 654):

> (a) Each employer—
>
> (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
>
> (2) shall comply with occupational safety and health standards promulgated under this chapter.
>
> (b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this chapter which are applicable to his own actions and conduct.

3. Section 6 (29 U.S.C. § 655):

> (a) Without regard to chapter 5 of Title 5 or to the other subsections of this section, the Secretary shall, as soon as practicable during the period beginning with the effective date of this chapter and ending two years after such date, by rule promulgate as an occupational safety or health standard any national consensus standard, and any established

Federal standard, unless he determines that the promulgation of such a standard would not result in improved safety or health for specifically designated employees. In the event of conflict among any such standards, the Secretary shall promulgate the standard which assures the greatest protection of the safety or health of the affected employees.

(b) The Secretary may by rule promulgate, modify, or revoke any occupational safety or health standard in the following manner:

(1) Whenever the Secretary, upon the basis of information submitted to him in writing by an interested person, a representative of any organization of employers or employees, a nationally recognized standards-producing organization, the Secretary of Health, Education, and Welfare, the National Institute for Occupational Safety and Health, or a State or political subdivision, or on the basis of information developed by the Secretary or otherwise available to him, determines that a rule should be promulgated in order to serve the objectives of this chapter, the Secretary may request the recommendations of an advisory committee appointed under section 656 of this title. The Secretary shall provide such an advisory committee with any proposals of his own or of the Secretary of Health, Education, and Welfare, together with all pertinent factual information developed by the Secretary or the Secretary of Health, Education, and Welfare, or otherwise available, including the results of research, demonstrations, and experiments. An advisory committee shall submit to the Secretary its recommendations regarding the rule to be promulgated within ninety days from the date of its appointment or within such longer or shorter period as may be prescribed by the Secretary, but in no event for a period which is longer than two hundred and seventy days.

(2) The Secretary shall publish a proposed rule promulgating, modifying, or revoking an occupational safety or health standard in the Federal Register and shall afford interested persons a period of thirty days after publication to submit written data or comments. Where an advisory committee is appointed and the Secretary determines that a rule should be issued, he shall publish the proposed rule within sixty days after the submission of the advisory committee's recommendations or the expiration of the period prescribed by the Secretary for such submission.

(3) On or before the last day of the period provided for the submission of written data or comments under paragraph (2), any interested person may file with the Secretary written objections to the proposed rule, stating the grounds therefor and requesting a public hearing on such objections. Within thirty days after the last day for filing such objections, the Secretary shall publish in the Federal Register a notice specifying the occupational safety or health standard to which objections have been filed and a hearing requested, and specifying a time and place for such hearing.

(4) Within sixty days after the expiration of the period provided for the submission of written data or comments under paragraph (2), or within sixty days after the completion of any hearing held under paragraph (3), the Secretary shall issue a rule promulgating, modifying, or revoking an occupational safety or health stand-

ard or make a determination that a rule should not be issued. Such a rule may contain a provision delaying its effective date for such period (not in excess of ninety days) as the Secretary determines may be necessary to insure that affected employers and employees will be informed of the existence of the standard and of its terms and that employers affected are given an opportunity to familiarize themselves and their employees with the existence of the requirements of the standard.

(5) The Secretary, in promulgating standards dealing with toxic materials or harmful physical agents under this subsection, shall set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life. Development of standards under this subsection shall be based upon research, demonstrations, experiments, and such other information as may be appropriate. In addition to the attainment of the highest degree of health and safety protection for the employee, other considerations shall be the latest available scientific data in the field, the feasibility of the standards, and experience gained under this and other health and safety laws. Whenever practicable, the standard promulgated shall be expressed in terms of objective criteria and of the performance desired.

* * * *

(7) Any standard promulgated under this subsection shall prescribe the use of labels or

other appropriate forms of warning as are necessary to insure that employees are apprised of all hazards to which they are exposed, relevant symptoms and appropriate emergency treatment, and proper conditions and precautions of safe use or exposure. Where appropriate, such standard shall also prescribe suitable protective equipment and control or technological procedures to be used in connection with such hazards and shall provide for monitoring or measuring employee exposure at such locations and intervals, and in such manner as may be necessary for the protection of employees. In addition, where appropriate, any such standard shall prescribe the type and frequency of medical examinations or other tests which shall be made available, by the employer or at his cost, to employees exposed to such hazards in order to most effectively determine whether the health of such employees is adversely affected by such exposure. In the event such medical examinations are in the nature of research, as determined by the Secretary of Health, Education, and Welfare, such examinations may be furnished at the expense of the Secretary of Health, Education, and Welfare. The results of such examinations or tests shall be furnished only to the Secretary or the Secretary of Health, Education, and Welfare, and, at the request of the employee, to his physician. The Secretary, in consultation with the Secretary of Health, Education, and Welfare, may by rule promulgated pursuant to section 553 of Title 5, make appropriate modifications in the foregoing requirements relating to the use of labels or other forms of warning, monitoring, or measuring, and medical examinations, as may be warranted by experience, infor-

mation, or medical or technological developments acquired subsequent to the promulgation of the relevant standard.

(8) Whenever a rule promulgated by the Secretary differs substantially from an existing national consensus standard, the Secretary shall, at the same time, publish in the Federal Register a statement of the reasons why the rule as adopted will better effectuate the purposes of this chapter than the national consensus standard.

* * * *

(e) Whenever the Secretary promulgates any standard, makes any rule, order, or decision, grants any exemption or extension of time, or compromises, mitigates, or settles any penalty assessed under this chapter, he shall include a statement of the reasons for such action, which shall be published in the Federal Register.

(f) Any person who may be adversely affected by a standard issued under this section may at any time prior to the sixtieth day after such standard is promulgated file a petition challenging the validity of such standard with the United States court of appeals for the circuit wherein such person resides or has his principal place of business, for a judicial review of such standard. A copy of the petition shall be forthwith transmitted by the clerk of the court to the Secretary. The filing of such petition shall not, unless otherwise ordered by the court, operate as a stay of the standard. The determinations of the Secretary shall be conclusive if supported by substantial evidence in the record considered as a whole.

* * * *

4. Section 9 (29 U.S.C. § 658):

(a) If, upon inspection or investigation, the Secretary or his authorized representative believes that an employer has violated a requirement of section 654 of this title, of any standard, rule, or order promulgated pursuant to section 655 of this title, or of any regulations prescribed pursuant to this chapter, he shall with reasonable promptness issue a citation to the employer. Each citation shall be in writing and shall describe with particularity the nature of the violation, including a reference to the provision of the chapter, standard, rule, regulation, or order alleged to have been violated. In addition, the citation shall fix a reasonable time for the abatement of the violation. The Secretary may prescribe procedures for the issuance of a notice in lieu of a citation with respect to de minimis violations which have no direct or immediate relationship to safety or health.

(b) Each citation issued under this section, or a copy or copies thereof, shall be prominently posted, as prescribed in regulations issued by the Secretary, at or near each place a violation referred to in the citation occurred.

(c) No citation may be issued under this section after the expiration of six months following the occurrence of any violation.

5. Section 17 (29 U.S.C. § 666):

(a) Any employer who willfully or repeatedly violates the requirements of section 654 of this title, any standard, rule, or order promulgated pursuant to section 655 of this title, or regulations prescribed pursuant to this chapter, may be assessed a civil penalty of not more than $10,000 for each violation.

(b) Any employer who has received a citation for a serious violation of the requirements of section 654 of this title, of any standard, rule, or order promulgated pursuant to section 655 of this title, or of any regulations prescribed pursuant to this chapter, shall be assessed a civil penalty of up to $1,000 for each such violation.

(c) Any employer who has received a citation for a violation of the requirements of section 654 of this title, of any standard, rule, or order promulgated pursuant to section 655 of this title, or of regulations prescribed pursuant to this chapter, and such violation is specifically determined not to be of a serious nature, may be assessed a civil penalty of up to $1,000 for each such violation.

(d) Any employer who fails to correct a violation for which a citation has been issued under section 658(a) of this title within the period permitted for its correction (which period shall not begin to run until the date of the final order of the Commission in the case of any review proceeding under section 659 of this title initiated by the employer in good faith and not solely for delay or avoidance of penalties), may be assessed a civil penalty of not more than $1,000 for each day during which such failure or violation continues.

(e) Any employer who willfully violates any standard, rule, or order promulgated pursuant to section 655 of this title, or of any regulations prescribed pursuant to this chapter, and that violation caused death to any employee, shall, upon conviction, be punished by a fine of not more than $10,000 or by imprisonment for not more than six months, or by both; except that if the conviction is for a violation committed after a first conviction of such person, punishment shall be by a fine of not more than

$20,000 or by imprisonment for not more than one year, or by both.

(f) Any person who gives advance notice of any inspection to be conducted under this chapter, without authority from the Secretary or his designees, shall, upon conviction, be punished by a fine of not more than $1,000 or by imprisonment for not more than six months, or by both.

(g) Whoever knowingly makes any false statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to this chapter shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than six months, or by both.

(h) Any employer who violates any of the posting requirements, as prescribed under the provisions of this chapter, shall be assessed a civil penalty of up to $1,000 for each violation.

(i) The Commission shall have authority to assess all civil penalties provided in this section, giving due consideration to the appropriateness of the penalty with respect to the size of the business of the employer being charged, the gravity of the violation, the good faith of the employer, and the history of previous violations.

(j) For purposes of this section, a serious violation shall be deemed to exist in a place of employment if there is a substantial probability that death or serious physical harm could result from a condition which exists, or from one or more practices, means, methods, operations, or processes which have been adopted or are in use, in such place of employment unless the employer did not, and could not

with the exercise of reasonable diligence, know of the presence of the violation.

(k) Civil penalties owed under this chapter shall be paid to the Secretary for deposit into the Treasury of the United States and shall accrue to the United States and may be recovered in a civil action in the name of the United States brought in the United States district court for the district where the violation is alleged to have occurred or where the employer has its principal office.

APPENDIX F

OSHA's Coke Oven Emissions Standard, codified in 29 C.F.R. § 1910.1029 (1977) (originally published in 41 Fed.Reg. 46784-90 (Oct. 22, 1976)):

(a) *Scope and application.* This section applies to the control of employee exposure to coke oven emissions, except that this section shall not apply to working conditions with regard to which other Federal agencies exercise statutory authority to prescribe or enforce standards affecting occupational safety and health.

(b) *Definitions.* For the purpose of this section: "Authorized person" means any person specifically authorized by the employer whose duties require the person to enter a regulated area, or any person entering such an area as a designated representative of employees for the purpose of exercising the opportunity to observe monitoring and measuring procedures under paragraph (n) of this section.

"Beehive oven" means a coke oven in which the products of carbonization other than coke are not recovered, but are released into the ambient air.

"Coke oven" means a retort in which coke is produced by the destructive distillation or carbonization of coal.

"Coke oven battery" means a structure containing a number of slot-type coke ovens.

"Coke oven emissions" means the benzene-soluble fraction of total particulate matter present during the destructive distillation or carbonization of coal for the production of coke.

"Director" means the Director, National Institute for Occupational Safety and Health, U.S. Department of Health, Education, and Welfare, or his or her designee.

"Emergency" means any occurence [*sic*] such as, but not limited to, equipment failure which is likely to, or does, result in any massive release of coke oven emissions.

"Existing coke oven battery" means a battery in operation or under construction on January 20, 1977, and which is not a rehabilitated coke oven battery.

"Rehabilitated coke oven battery" means a battery which is rebuilt, overhauled, renovated, or restored such as from the pad up, after January 20, 1977.

"Secretary" means the Secretary of Labor, U.S. Department of Labor, or his or her designee.

"Stage charging" means a procedure by which a predetermined volume of coal in each larry car hopper is introduced into an oven such that no more than two hoppers are discharging simultaneously.

"Sequential charging" means a procedure, usually automatically timed, by which a predetermined volume of coal in each larry car hopper is introduced into an oven such that no more than two hoppers commence or finish discharging simultaneously although, at some point, all hoppers are discharging simultaneously.

"Pipeline charging" means any apparatus used to introduce coal into an oven which uses a pipe or duct permanently mounted onto an oven and through which coal is charged.

"Green plush" [*sic*] means coke which when removed from the oven results in emissions due to the presence of unvolatilized coal.

(c) *Permissible exposure limit.* The employer shall assure that no employee in the regulated area is exposed to coke oven emissions at concentrations greater than 150 micrograms per cubic meter of air (150 $\mu g/m^3$), averaged over any 8-hour period.

(d) *Regulated areas.* (1) The employer shall establish regulated areas and shall limit access to them to authorized persons.

(2) The employer shall establish the following as regulated areas:

(i) The coke oven battery including topside and its machinery, pushside and its machinery, coke side and its machinery, and the battery ends; the wharf; and the screening station;

(ii) The beehive oven and its machinery.

(e) *Exposure monitoring and measurement*—(1) *Monitoring program.* (i) Each employer who has a place of employment where coke oven emissions are present shall monitor employees employed in the regulated area to measure their exposure to coke oven emissions.

(ii) The employer shall obtain measurements which are representative of each employee's exposure to coke oven emissions over an eight-hour period. All measurements shall determine exposure without regard to the use of respiratory protection.

(iii) The employer shall collect full-shift (for at least seven continuous hours) personal samples, including at least one sample during each shift for each battery and each job classification within the regulated areas including at least the following job classifications:

(*a*) Lidman;

(*b*) Tar chaser;

(*c*) Larry car operator;

(*d*) Luterman;

(*e*) Machine operator, coke side;

(*f*) Benchman, coke side;

(*g*) Benchman, pusher side;

(*h*) Heater;

(*i*) Quenching car operator;

(*j*) Pusher machine operator;

(*k*) Screening station operator;

(*l*) Wharfman;

(*m*) Oven patcher;

(*n*) Oven repairman;

(*o*) Spellman; and

(*p*) Maintenance personnel.

(iv) The employer shall repeat the monitoring and measurements required by this paragraph (e) (1) at least every three months.

(2) *Redetermination.* Whenever there has been a production, process, or control change which may result in new or additional exposure to coke oven emissions, or whenever the employer has any other reason to suspect an increase in employee exposure, the employer shall repeat the monitoring and measurements required by paragraph (e) (1) of this section for those employees affected by such change or increase.

(3) *Employee notification.* (i) The employer shall notify each employee in writing of the exposure measurements which represent that employe's exposure within five working days after the receipt of the results of measurements required by paragraphs (e) (1) and (e) (2) of this section.

(ii) Whenever such results indicate that the representative employee exposure exceeds the permissible exposure limit, the employe shall, in such notification, inform each employee of that fact and of the corrective

action being taken to reduce exposure to or below the permissible exposure limit.

(4) *Accuracy of measurement.* The employer shall use a method of monitoring and measurement which has an accuracy (with a confidence level of 95%) of not less than plus or minus 35% for concentrations of coke oven emissions greater than or equal to 150 $\mu g/m^3$.

(f) *Methods of compliance.* The employer shall control employee exposure to coke oven emissions by the use of engineering controls, work practices and respiratory protection as follows:

(1) *Priority of compliance methods*—(i) *Existing coke oven batteries.* (*a*) The employer shall institute the engineering and work practice controls listed in paragraphs (f) (2), (f) (3) and (f) (4) of this section in existing coke oven batteries at the earliest possible time, but not later than January 20, 1980, except to the extent that the employer can establish that such controls are not feasible. In determining the earliest possible time for institution of engineering and work practice controls, the requirement, effective August 27, 1971, to implement feasible administrative or enginereing controls to reduce exposures to coal tar pitch volatiles, shall be considered. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of paragraph (g) of this section.

(*b*) The engineering and work practice controls required under paragraphs (f) (2), (f) (3) and (f) (4) of this section are minimum requirements generally applicable to all existing coke oven batteries. If, after im-

plementing all controls required by paragraphs (f) (2), (f) (3) and (f) (4) of this section, or after January 20, 1980, whichever is sooner, employee exposures still exceed the permissible exposure limit, employers shall research, develop and implement any other engineering and work practice controls necessary to reduce exposure to or below the permissible exposure limit except to the extent that the employer can establish that such controls are not feasible. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of paragraph (g) of this section.

(ii) *New or rehabilitated coke oven batteries.* (*a*) The employer shall institute the best available engineering and work practice controls on all new or rehabilitated coke oven batteries to reduce and maintain employee exposures at or below the permissible exposure limit, except to the extent that the employer can establish that such controls are not feasible. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of paragraph (g) of this section.

(*b*) If after implementing all the engineering and work practice controls required by paragraph (f) (1) (ii) (*a*) of this section, employee exposures still exceed the permissible exposure limit, the employer shall research, develop and implement any other engineering and work practice controls necessary to reduce exposure to or be-

low the permissible exposure limit except to the extent that the employer can establish that such controls are not feasible. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of paragraph (g) of this section.

(iii) *Beehive ovens.* (*a*) The employer shall institute engineering and work practice controls on all beehive ovens at the earliest possible time to reduce and maintain employee exposures at or below the permissible exposure limit, except to the extent that the employer can establish that such controls are not feasible. In determining the earliest possible time for institution of engineering and work practice controls, the requirement, effective August 27, 1971, to implement feasible administrative or engineering controls to reduce exposures to coal tar pitch volatiles, shall be considered. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of paragraph (g) of this section.

(*b*) If, after implementing all engineering all engineering and work practice controls required by paragraph (f) (1) (iii) (*a*) of this section, employee exposures still exceed the permissible exposure limit, the employer shall research, develop, and implement any other engineering and work practice controls necessary to reduce exposures to or below the permissible exposure limit ex-

cept to the extent that the employer can establish that such controls are not feasible. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposure to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of paragraph (g) of this section.

(2) *Engineering controls*—(i) *Charging.* The employer shall equip and operate existing coke oven batteries with all of the following engineering controls to control coke oven emissions during charging operations:

(*a*) One of the following methods of charging:

(*1*) Stage charging as described in paragraph (f) (3) (i) (*b*) of this section; or

(*2*) Sequential charging as described in paragraph (f) (3) (i) (*b*) of this section except that paragraph (f) (3) (i) (*b*) (*3*) (*iv*) of this section does not apply to sequential charging; or

(*3*) Pipeline charging or other forms of enclosed charging in accordance with paragraph (f) (2) (i) of this section, except that paragraphs (f) (2) (i) (*b*), (*d*), (*e*), (*f*) and (*h*) of this section do not apply;

(*b*) Drafting from two or more points in the oven being charged, through the use of double collector mains, or a fixed or moveable jumper pipe system to another oven, to effectively remove the gases from the oven to the collector mains;

(*c*) Aspiration systems designed and operated to provide sufficient negative pressure and flow volume to effectively move the gases evolved during charging into the collector mains, including sufficient steam pressure, and steam jets of sufficient diameter;

(*d*) Mechanical volumetric controls on each larry car hopper to provide the proper amount of coal to be charged through each charging hole so that the tunnel head will be sufficient to permit the gases to move from the oven into the collector mains;

(*e*) Devices to facilitate the rapid and continuous flow of coal into the oven being charged, such as stainless steel liners, coal vibrators or pneumatic shells;

(*f*) Individually operated larry car drop sleeves and slide gates designed and maintained so that the gases are effectively removed from the oven into the collector mains;

(*g*) Mechanized gooseneck and standpipe cleaners;

(*h*) Air seals on the pusher machine leveler bars to control air infiltration during charging; and

(*i*) Roof carbon cutters or a compressed air system or both on the pusher machine rams to remove roof carbon.

(ii) *Coking.* The employer shall equip and operate existing coke oven batteries with all of the following engineering controls to control coke oven emissions during coking operations;

(*a*) A pressure control system on each battery to obtain uniform collector main pressure;

(*b*) Ready access to door repair facilities capable of prompt and efficient repair of doors, door sealing edges and all door parts;

(*c*) An adequate number of spare doors available for replacement purposes;

(*d*) Chuck door gaskets to control chuck door emissions until such door is repaired, or replaced; and

(*e*) Heat shields on door machines.

(3) *Work practice controls.* (i) *Charging.* The employer shall operate existing coke oven batteries with all of the following work practices to control coke oven emissions during the charging operation:

(*a*) Establishment and implementation of a detailed, written inspection and cleaning procedure for each battery consisting of at least the following elements:

(*1*) Prompt and effective repair or replacement of all engineering controls;

(*2*) Inspection and cleaning of goosenecks and standpipes prior to each charge to a specified minimum diameter sufficient to effectively move the evolved gases from the oven to the collector mains;

(*3*) Inspection for roof carbon buildup prior to each charge and removal of roof carbon as necessary to provide an adequate gas channel so that the gases are effectively moved from the oven into the collector mains;

(*4*) Inspection of the steam aspiration system prior to each charge so that sufficient pressure and volume is maintained to effectively move the gases from the oven to the collector mains;

(*5*) Inspection of steam nozzles and liquor sprays prior to each charge and cleaning as necessary so that the steam nozzles and liquor sprays are clean;

(*6*) Inspection of standpipe caps prior to each charge and cleaning and luting or both as necessary so that the gases are effectively moved from the oven to the collector mains; and

(*7*) Inspection of charging holes and lids for cracks, warpage and other defects prior to each charge and removal of carbon to prevent emissions, and application of luting material to standpipe and charging hole lids where necessary to obtain a proper seal.

(*b*) Establishment and implementation of a detailed written charging procedure, designed and operated to eliminate emissions during charging for each battery, consisting of at least the following elements:

(*1*) Larry car hoppers filled with coal to a predetermined level in accordance with the mechanical volumetric controls required under paragraph (f) (2) (i) (*d*) of this section so as to maintain a sufficient gas passage in the oven to be charged;

(*2*) The larry car aligned over the oven to be charged, so that the drop sleeves fit tightly over the charging holes; and

(*3*) The oven charged in accordance with the following sequence of requirements:

(*i*) The aspiration system turned on;

(*ii*) Coal charged through the outer-most hoppers, either individually or together depending on the capacity of the aspiration system to collect the gases involved;

(*iii*) The charging holes used under paragraph (f) (3) (i) (*b*) (*3*) (*ii*) of this section relidded or otherwise sealed off to prevent leakage of coke oven emissions;

(*iv*) If four hoppers are used, the third hopper discharged and relidded or otherwise sealed off to prevent leakage of coke oven emissions;

(*v*) The final hopper discharged until the gas channel at the top of the oven is blocked and then the chuck door opened and the coal leveled;

(*vi*) When the coal from the final hopper is discharged and the leveling operation complete, the charging hole relidded or otherwise sealed off to prevent leakage of coke oven emissions; and

(*vii*) The aspiration system turned off only after the charging holes have been closed.

(*c*) Establishment and implementation of a detailed written charging procedure, designed and operated to eliminate emissions during charging of each pipeline or enclosed charged battery.

(ii) *Coking.* The employer shall operate existing coke oven batteries pursuant to a detailed written procedure established and implemented for the control of coke oven emissions during coking, consisting of at least the following elements:

(*a*) Checking oven back pressure controls to maintain uniform pressure conditions in the collecting main;

(*b*) Repair, replacement and adjustment of oven doors and chuck doors and replacement of door jambs so as to provide a continuous metal-to-metal fit;

(*c*) Cleaning of oven doors, chuck doors and door jambs each coking cycle so as to provide an effective seal;

(*d*) An inspection system and corrective action program to control door emissions to the maximum extent possible; and

(*e*) Luting of doors that are sealed by luting each coking cycle and reluting, replacing or adjusting as necessary to control leakage.

(iii) *Pushing.* The employer shall operate existing coke oven batteries with the following work practices to control coke oven emissions during pushing operations:

(*a*) Coke and coal spillage quenched as soon as practicable and not shoveled into a heated oven; and

(*b*) A detailed written procedure for each battery established and implemented for the control of emissions during pushing consisting of the following elements:

(*1*) Dampering off the ovens and removal of charging hole lids to effectively control coke oven emissions during the push;

(*2*) Heating of the coal charge uniformly for a sufficient period so as to obtain proper coking including preventing green pushes;

(*3*) Prevention of green pushes to the maximum extent possible;

(*4*) Inspection, adjustment and correction of heating flue temperatures and defective flues at least weekly and after any green push, so as to prevent green pushes;

(*5*) Cleaning of heating flues and related equipment to prevent green pushes, at least weekly and after any green push.

(iv) *Maintenance and repair.* The employer shall operate existing coke oven batteries pursuant to a detailed written procedure of maintenance and repair established and implemented for the effective control of coke oven emissions consisting of the following elements:

(*a*) Regular inspection or all controls, including goosenecks, standpipes, standpipe caps, charging hold lids and castings, jumper pipes and air seals for cracks, misalignment of other defects and prompt implementation of the necessary repairs as soon as possible;

(*b*) Maintaining the regulated area in a neat, orderly condition free of coal and coke spillage and debris;

(*c*) Regular inspection of the damper system, aspiration system and collector main for cracks or leakage, and prompt implementation of the necessary repairs;

(*d*) Regular inspection of the heating system and prompt implementation of the necessary repairs;

(*e*) Prevention of miscellaneous fugitive topside emissions;

(*f*) Regular inspection and patching of oven brickwork;

(*g*) Maintenance of battery equipment and controls in good working order;

(*h*) Maintenance and repair of coke oven doors, chuck doors, door jambs and seals; and

(*i*) Repairs instituted and completed as soon as possible, including temporary repair measures instituted and completed where necessary, including but not limited to:

(*1*) Prevention of miscellaneous fugitive topside emissions; and

(*2*) Chuck door gaskets, which shall be installed prior to the start of the next coking cycle.

(4) *Filtered air.* (i) The employer shall provide positive-pressure, temperature controlled filtered air for larry car, pusher machine, door machine, and quench car cabs.

(ii) The employer shall provide standby pulpits on the battery topside, at the wharf, and at ther screening station, equipped with positive-pressure, temperature controlled filtered air.

(5) *Emergencies.* Whenever an emergency occurs, the next coking cycle may not begin until the cause of the emergency is determined and corrected, unless the employer can establish that it is necessary to initiate the next coking cycle in order to determine the cause of the emergency.

(6) *Compliance program.* (i) Each employer shall establish and implement a written program to reduce exposures solely by means of the engineering and work practice controls required in paragraph (f) of this section.

(ii) The written program shall include at least the following:

(*a*) A description of each coke oven operation by battery, including work force and operating crew, coking time, operating procedures and maintenance practices;

(*b*) Engineering plans and other studies used to determine the controls for the coke battery;

(*c*) A report of the technology considered in meeting the permissible exposure limit:

(*d*) Monitoring data obtained in accordance with paragraph (e) of this section;

(*e*) A detailed schedule for the implementation of the engineering and work practice controls required in paragraph (f) of this section; and

(*f*) Other relevant information.

(iii) If, after implementing all controls required by paragraph (f)(2)-(f)(4) of this section, or after January 20, 1980, whichever is sooner, or after completion of a new or rehabilitated battery the permissible exposure limit is still exceeded, the employer shall develop a detailed written program and schedule for the development and implementation of any additional engineering controls and work practices necessary to reduce exposure to or below the permissible exposure limit.

(iv) Written plans for such programs shall be submitted, upon request, to the Secretary and the Director, and shall be available at the worksite for examination and copying by the Secretary, the Director, and the authorized employee representative. The plans required under paragraph (f)(6) of this section shall be revised and updated at least every six months to reflect the current status of the program.

(7) *Training in compliance procedures.* The employer shall incorporate all written procedures and schedules required under this paragraph (f) in the information and training program required under paragraph (k) of this section and, where appropriate, post in the regulated area.

(g) *Respiratory protection*—(1) *General.* (i) Where respiratory protection is required under this section, the employer shall provide and assure the use of respirators which comply with the requirements of this paragraph (g). Compliance with the permissible exposure limit may not be achieved by the use of respirators except:

(*a*) During the time period necessary to install or implement feasible engineering and work practice controls; or

(*b*) In work operations such as maintenance and repair activity in which engineering and work practice controls are technologically not feasible; or

(*c*) In work situations where feasible engineering and work practice controls are not yet sufficient to reduce exposure to or below the permissible exposure limit; or

(*d*) *In emergencies.*

(ii) Notwithstanding any other requirement of this section, until January 20, 1978, the wearing of respirators shall be at the discretion of each employee where the employee is not in the vicinity of visible emissions.

(2) *Selection.* (i) Where respirators are required under this section, the employer shall select, provide and assure the use of the appropriate respirator or combination of respirators from Table I below.

TABLE I

RESPIRATORY PROTECTION FOR COKE OVEN EMISSIONS

Airborne concentration of coke oven emissions	Required respirator
(*a*) Any concentration	(*1*) A Type C supplied air respirator operated in pressure demand or other positive pressure or continuous flow mode; or
	(*2*) A powered air-purifying particulate filter respirator for dust and mist or
	(*3*) A powered air-purifying particulate filter respirator or combination chemical cartridge and particulate filter respirator for coke oven emissions.
(*b*) Concentrations not greater than 1500 $\mu g/m^3$.	(*1*) Any particulate filter respirator for dust and mist except single-use respirator; or
	(*2*) Any particulate filter respirator or combination chemical cartridge and particulate filter respirator for coke oven emissions; or
	(*3*) Any respirator listed in paragraph (g)(2)(i)(*a*) of this section.

(ii) Not later than January 20, 1978, whenever respirators are required by this section for concentrations not greater than 1500 $\mu g/m^3$, the employer shall provide, at the option of each affected employee, either a particulate filter respirator as provided in paragraph (g)(2)(i)(*b*) of this section, or a powered air-purifying respirator as provided in paragraph (g)(2)(i)(*a*) of this section.

(iii) The employer shall select respirators from among those approved for protection against dust and mist by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11, except that not later than January 20, 1979, the employer shall

select respirators from among those approved by NIOSH for protection against coke oven emissions.

(3) *Respirator program.* The employer shall institute a respiratory protection program in accordance with § 1910.134 of this part.

(4) *Respirator usage.* (i) The employer shall assure that the respirator issued to the employee exhibits minimum facepiece leakage and that the respirator is fitted properly. The employer shall perform quantitative fit tests annually for each employee who uses a non-powered, particulate filter respirator.

(ii) The employer shall allow each employee who uses a filter respirator to change the filter elements whenever an increase in breathing resistance is detected and shall maintain an adequate supply of filter elements for this purpose.

(iii) The employer shall allow employees who wear respirators to wash their face and respirator facepiece to prevent skin irritation associated with respirator use.

(h) *Protective clothing and equipment*—(1) *Provision and use.* The employer shall provide and assure the use of appropriate protective clothing and equipment, such as but not limited to:

(i) Flame resistant jacket and pants;

(ii) Flame resistant gloves;

(iii) Face shields or vented goggles which comply with § 1910.133(a)(2) of this part;

(iv) Footwear providing insulation from hot surfaces for footwear;

(v) Safety shoes which comply with § 1910.136 of this part; and

(vi) Protective helmets which comply with § 1910.135 of this part.

(2) *Cleraning* [*sic*] *and replacement.* (i) The employer shall provide the protective clothing required by paragraphs (h)(1)(i) and (ii) of this section in a clean and dry condition at least weekly.

(ii) The employer shall clean, launder, or dispose of protective clothing required by paragraphs (h)(1)(i) and (ii) of this section.

(iii) The employer shall repair or replace the protective clothing and equipment as needed to maintain their effectiveness.

(iv) The employer shall assure that all protective clothing is removed at the completion of a work shift only in change rooms prescribed in paragraph (i)(1) of this section.

(v) The employer shall assure that contaminated protective clothing which is to be cleaned, laundered, or disposed of, is placed in a closable container in the change room.

(vi) The employer shall inform any person who cleans or launders protective clothing required by this section, of the potentially harmful effects of exposure to coke oven emissions.

(i) *Hygiene facilities and practices*—(1) *Change rooms.* The employer shall provide clean change rooms equipped with storage facilities for street clothes and separate storage facilities for protective clothing and equipment whenever employees are required to wear protective clothing and equipment in accordance with paragraph (h)(1) of this section.

(2) *Showers.* (i) The employer shall assure that employees working in the regulated area shower at the end of the work shift.

(ii) The employer shall provide shower facilities in accordance with § 1910.141(d)(3) of this Part.

(3) *Lunchrooms.* The employer shall provide lunchroom facilities which have a temperature controlled, positive pressure, filtered air supply, and which are readily accessible to employees working in the regulated area.

(4) *Lavatories.* (i) The employer shall assure that employees working in the regulated area wash their hands and face prior to eating.

(ii) The employer shall provide lavatory facilities in accordance with § 1910.141(d)(1) and (2) of this Part.

(5) *Prohibition of activities in the regulated area.* (i) The employer shall assure that in the regulated area, food or beverages are not present or consumed, smoking products are not present or used, and cosmetics are not applied, except that these activities may be conducted in the lunchrooms, change rooms and showers required under paragraphs (i)(1)-(i)(3) of this section.

(ii) Drinking water may be consumed in the regulated area.

(j) *Medical surveillance*—(1) *General requirements.* (i) Each employer shall institute a medical surveillance program for all employees who are employed in a regulated area at least 30 days per year.

(ii) The program shall provide each employee covered under paragraph (j)(1)(i) of this section with an opportunity for medical examinations in accordance with this paragraph (j).

(iii) The employer shall inform any employee who refuses any required medical examination of the possible health consequences of such refusal and shall obtain a signed statement from the employee indicating that the employee understands the risk involved in the refusal to be examined.

(iv) The employer shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician, and are provided without cost to the employee.

(2) *Initial examinations.* At the time of initial assignment to a regulated area or upon the institution of the medical surveillance program, the employer shall provide a medical examination for employees covered under paragraph (j)(1)(i) of this section including at least the following elements:

(i) A work history and medical history which shall include smoking history and the presence and degree of respiratory symptoms, such as breathlessness, cough, sputum production, and wheezing;

(ii) A 14″x17″ posterior-anterior chest x-ray and International Labour Office UICC/Cincinnati (ILO U/C) rating;

(iii) Pulmonary function tests including forced vital capacity (FVC) and forced expiratory volume at one second (FEV 1.0) with recording of type of equipment used;

(iv) Weight;

(v) A skin examination;

(vi) Urinalysis for sugar, albumin, and hematuria;

(vii) A sputum cytology examination; and

(viii) A urinary cytology examination.

(3) *Periodic Examinations.* (i) The employer shall provide the examinations specified in paragraphs (j)(2)(i)-(vi) of this section at least annually for employees covered under paragraph (j)(1)(i) of this section.

(ii) The employer shall provide the examinations specified in paragraphs (j)(2)(i)-(viii) of this section at least

semi-annually for employees 45 years of age or older or with five (5) or more years employment in the regulated area.

(iii) Whenever an employee who is 45 years of age or older or with five (5) or more years employment in the regulated area transfers or is transferred from employment in the regulated area, the employer shall continue to provide the examinations specified in paragraphs (j)(2)(i)-(viii) of this section semi-annually, as long as that employee is employed by the same employer or a successor employer.

(iv) Whenever an employee has not taken the examinations specified in paragraphs (j)(3)(i)-(iii) of this section with the six (6) months preceding the termination of employment the employer shall provide such examinations to the employee upon termination of employment.

(4) *Information provided to the physician.* The employer shall provide the following information to the examining physician:

(i) A copy of this regulation and its Appendixes;

(ii) A description of the affected employee's duties as they relate to the employee's exposure;

(iii) The employee's exposure level or estimated exposure level;

(iv) A description of any personal protective equipment used or to be used; and

(v) Information from previous medical examinations of the affected employee which is not readily available to the examining physician.

(5) *Physician's written opinion.* (i) The employer shall obtain a written opinion from the examining physician which shall include:

(*a*) The results of the medical examinations;

(*b*) The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from exposure to coke oven emissions;

(*c*) Any recommended limitations upon the employee's exposure to coke oven emissions or upon the use of protective clothing or equipment such as respirators; and

(*d*) A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further explanation or treatment.

(ii) The employer shall instruct the physician not to reveal in the written opinion specific findings or diagnoses unrelated to occupational exposure.

(iii) The employer shall provide a copy of the written opinion to the affected employee.

(k) *Employee information and training*—(1) *Training program.* (i) The employer shall institute a training program for employees who are employed in the regulated area and shall assure their participation.

(ii) The training program shall be provided as of January 27, 1977 for employees who are employed in the regulated area at that time or at the time of initial assignment to a regulated area.

(iii) The training program shall be provided at least annually for all employees who are employed in the regulated area, except that training regarding the occupational safety and health hazards associated with exposure to coke oven emissions and the purpose, proper use, and limitations of respiratory protective devices shall be provided at least quarterly until January 20, 1978.

(iv) The training program shall include informing each employee of:

(*a*) The information contained in the substance information sheet for coke oven emissions (Appendix A);

(*b*) The purpose, proper use, and limitations of respiratory protective devices required in accordance with paragraph (g) of this section;

(*c*) The purpose for and a description of the medical surveillance program required by paragraph (j) of this section including information on the occupational safety and health hazards associated with exposure to coke oven emissions;

(*d*) A review of all written procedures and schedules required under paragraph (f) of this section; and

(*e*) A review of this standard.

(2) *Access to training materials.* (i) The employer shall make a copy of this standard and its appendixes readily available to all employees who are employed in the regulated area.

(ii) The employer shall provide upon request all materials relating to the employee information and training program to the Secretary and the Director.

(l) *Precautionary signs and labels*—(1) *General.* (i) The employer may use labels or signs required by other statutes, regulations or ordinances in addition to, or in combination with, signs and labels required by this paragraph.

(ii) The employer shall assure that no statement appears on or near any sign required by this paragraph which contradicts or detracts from the effects of the required sign.

(iii) The employer shall assure that signs required by this paragraph are illuminated and cleaned as necessary so that the legend is readily visible.

(2) *Signs.* (i) The employer shall post signs in the regulated area bearing the legends:

DANGER

CANCER HAZARD

AUTHORIZED PERSONNEL ONLY

NO SMOKING OR EATING

(ii) In addition, not later than January 20, 1978, the employer shall post signs in the areas where the permissible exposure limit is exceeded bearing the legend:

DANGER

RESPIRATOR REQUIRED

(3) *Labels.* The employer shall apply precautionary labels to all containers of protective clothing contaminated with coke oven emissions bearing the legend:

CAUTION

CLOTHING CONTAMINATED WITH COKE EMISSIONS

DO NOT REMOVE DUST BY BLOWING OR SHAKING

(m) *Recordkeeping*—(1) *Exposure measurements.* The employer shall establish and maintain an accurate record of all measurements taken to monitor employee exposure to coke oven emissions required in paragraph (e) of this section.

(i) This record shall include:

(*a*) Name, social security number, and job classification of the employees monitored;

(*b*) The date(s), number, duration and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure where applicable;

(*c*) The type of respiratory protective devices worn, if any;

(*d*) A description of the sampling and analytical methods used and evidence of their accuracy; and

(*e*) The environmental variables that could affect the measurement of employee exposure.

(ii) The employer shall maintain this record for at least 40 years or for the duration of employment plus 20 years, whichever is longer.

(2) *Medical surveillance.* The employer shall establish and maintain an accurate record for each employee subject to medical surveillance as required by paragraph (j) of this section.

(i) The record shall include:

(*a*) The name, social security number, and description of duties of the employee;

(*b*) A copy of the physician's written opinion;

(*c*) The signed statement of any refusal to take a medical examination under paragraph (j) (1) (ii) of this section; and

(*d*) Any employee medical complaints related to exposure to coke oven emissions.

(ii) The employer shall keep, or assure that the examining physician keeps, the following medical records:

(*a*) A copy of the medical examination results including medical and work history required under paragraph (j) (2) of this section;

(b) A description of the laboratory procedures used and a copy of any standards or guidelines used to interpret the test results;

(*c*) The initial x-ray;

(*d*) The x-rays for the most recent five (5) years;

(*e*) Any x-ray with a demonstrated abnormality and all subsequent x-rays;

(*f*) The initial cytologic examination slide and written description;

(*g*) The cytologic examination slide and written description for the most recent 10 years; and

(*h*) Any cytologic examination slides with demonstrated atypia, if such atypia persists for 3 years, and all subsequent slides and written descriptions.

(iii) The employer shall maintain medical records required under paragraph (m) (2) of this section for at least 40 years, or for the duration of employment plus 20 years, whichever is longer.

(3) *Availability.* (i) The employer shall make available upon request all records required to be maintained by paragraph (m) of this section to the Secretary and the Director for examination and copying.

(ii) The employer shall make available upon request records of employee exposure measurements required by paragraph (m) (1) of this section for inspection and copying to affected employees and their designated representatives.

(iii) The employer shall make available upon request employee medical records required to be maintained by paragraph (m) (2) of this section to a physician designated by the affected employee or former employee.

(iv) The employer shall make available upon request records of employee exposure measurements required by paragraph (m)(1) of this section for inspection and copying to former employees and their designated representatives which indicate the former employees own exposures.

(4) *Transfer of records.* (i) Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by paragraph (m) of this section.

(ii) Whenever the employer ceases to do business and there is no successor employer to receive and retain the records for the prescribed period, these records shall be transmitted by registered mail to the Director.

(iii) At the expiration of the retention period for the records required to be maintained under paragraphs (m)(1) and (m)(2) of this section, the employer shall transmit these records by registered mail to the Director or shall continue to retain such records.

(n) *Observation of monitoring*—(1) *Employee observation.* The employer shall provide affected employees or their representatives an opportunity to observe any measuring or monitoring of employee exposure to coke oven emissions conducted pursuant to paragraph (e) of this section.

(2) *Observation procedures.* (i) Whenever observation of the measuring or monitoring of employee exposure to coke oven emissions requires entry into an area where the ues [*sic*] of protective clothing or equipment is required, the employer shall provide the observer with and assure the use of such equipment and shall require the observer to comply with all other applicable safety and health procedures.

(ii) Without interfering with the measurement, observers shall be entitled to:

(*a*) An Explanation of the measurement procedures;

(*b*) Observe all steps related to the measurement of coke oven emissions performed at the place of exposure; and

(*c*) Record the results obtained.

(o) *Effective date.* This standard shall become effective January 20, 1977.

(p) *Appendixes.* The information contained in the appendixes to this section is not intended, by itself, to create any additional obligations not otherwise imposed or to detract from any existing obligation.

APPENDIX G

Excerpts from OSHA's Summary and Explanation of the Standard, 41 Fed. Reg. 46751-84 (Oct. 22, 1976):

The following sections discuss the individual requirements of the standard. Each section includes an analysis of the record evidence, the recommendations of the Advisory Committee and NIOSH, and the policy considerations underpinning the decisions on the particular provisions of the standard. After consideration of all the evidence in the record, the final standard sets a permissible exposure limit to coke oven emissions of 150 $\mu g/m^3$ benzene soluble fraction of total particulate matter present during the destructive distillation or carbonization of coal. In addition, the standard specifies minimum engineering controls and work practice controls designed to reduce exposures to coke oven emissions. Additional controls and work practices are required where necessary and written compliance programs must be developed. Other portions of the standard including those on respirators, protective clothing, hygiene facilities, and exposure monitoring have been revised and clarified as described in detail below.

* * * *

A series of permissible exposure limits to BSFTPM have been considered in the course of the rulemaking. These range from a level of 0.56 mg/m^3 (560 $\mu g/m^3$) to a level of 0.05 mg/m^3 (50 $\mu g/m^3$).

The 0.56 mg/m^3 level has been recommended at different times by various industry participants as representing a safe level of exposure (Ex. 149, p. 66; 151). The level is taken from the major epidemiological study relating exposure to BSFTPM to excess mortality among coke oven workers (Ex. 8-29). According to the study, the data therein provide certain rough estimates of what

would constitute a safe level of exposure. The study gave an example of a worker exposed to less than 0.56 mg/m³ for a period of 30 years who would accumulate 200 mg/m³—months of exposure, a level which the data indicate would not increase the risk of lung cancer. The study concluded that a level of 0.2 mg/m³ is probably adequate protection since it would allow for increased exposure of those workers with over 30 years of work experience at the coke ovens.

At the rulemaking hearing, Dr. Redmond, one of the authors of the study, explained why 0.56 mg/m³ should not be used as a safe level of exposure. First, the model of carcinogenesis used in the study, the instantaneous cancer model, does not incorporate the concept of a latent period, which is inherent in current theories of carcinogenesis (TR 421). Dr. Redmond reported that analysis of the data using a latent period model lead to the conclusion that there was no exposure level that could be considered safe (TR 422).

Second, even accepting the instantaneous cancer model as used in the study, there was an insufficient number of white workers in the population to permit independent verification of the lung cancer excess that had been observed for blacks (TR 422).

Third, the excess cancer risk reported for coke oven workers was relative to the rates for the steelworker population. The lung cancer rate of the steelworker population tends to be the same as other Allegheny County (site of the study) populations, yet steelworkers tend to have higher lung cancer rates than the United States population as a whole (TR 1014). Hence, even if a level of 0.56 mg/m³ would reduce the risk of lung cancer for coke oven workers to that experienced by the steelworkers, coke oven workers would still be at a greater risk than the United States population as a whole.

Fourth, the time period of 30 years upon which 0.56 mg/m³ was based was used only by way of example (TR 1013), and in no way represents the maximum time that many workers spend in the coke oven environment (T 1014). As mentioned in the study itself, a lower level would be required to protect workers who were employed longer than 30 years (Ex. 8-29).

Fifth, the 0.56 mg/m³ level is based upon the fact that the cumulative exposure interval of less than 200 mg/m³—months exhibits no increased risk (Ex. 8-29). However, the value for the lung cancer rate for each interval is the average weight for the entire interval, and it is customary to use the mid-point of each interval as representing the average exposure (TR 1012). By taking the mid-points of the sub-intervals listed (Ex. 8-29, Table V), and weighting for the number of employees within each of these intervals, it can be determined that the average exposure for the interval is 77 mg/m³—months (TR 1012). Following the customary practice of using the mid-point determined average exposure (77 mg/m³—months) would reduce the "safe" exposure for a 30-year period of 0.56 mg/m³ by a factor of 77/200 to approximately 0.22 mg/m³ (TR 1012-3).

Finally, two sets of exposure data were available for use in this study, one from the State of Pennsylvania, which was used, and the other from AISI (TR 1013). The exposure levels of the AISI data were consistently lower than the levels used in the study (Ex. 8-18, Table VII-3; T 1013). Had these lower exposure levels been used in the study, then the average exposures of the intervals would have been correspondingly lower (TR 1013). Hence, the 0.56 mg/m³ level which was derived by dividing 200 mg/m³—months by 360 months (30 years) would also have been correspondingly lower.

Dr. Land's analysis of the excess risk associated with exposure at the 0.56 mg/m³ level also reveals that this is

not even close to a safe level (Ex. 82, Table 3). At an exposure level of 0.5 mg/m³, (the closest lower level examined to the suggested 0.56 mg/m³) from age 20 to age 65 or death, assuming a linear dose-response, with a dose model incorporating zero, five, ten and fifteen year lag periods the estimated excess risks are 0.0468, 0.0510, 0.0593, and 0.0708 respectively with relative risks of 99% to 151% greater than the normal lifetime risk of lung cancer mortality (Ex. 83, Table 3). Assuming a quadratic dose-response, at the same exposure level, for the same lag periods the estimated excess risks are 0.0179, 0.0222, 0.272, and 0.0372 respectively (Ex. 82, table 3). The relative risks for this model run from 38% to 79% greater than normal risk (Ex. 82, Table 3).

On the basis of Dr. Redmond's explanation of the reasons for not using 0.56 mg/m³ as a safe exposure level, the calculation by Dr. Land of the excess risks of lung cancer associated with exposure at this level, and the evidence in the record demonstrating the feasibility of reducing exposures to significantly lower levels, OSHA rejects the suggestion that setting the permissible exposure limit at 0.56 mg/m³ BSFTPM would provide an adequate measure of employee protection.

The existing standard (29 CFR 1910, 1000, Table Z-1 for the benzene-soluble fraction of coal tar pitch volatiles, which is viewed as BSFTPM, sets a maximum permissible exposure at 0.2 mg/m³ (200 ug/m³). The criteria Document (Ex. 2-18, p. II-2) included a recommendation that the existing standard for coal tar pitch volatiles be retained as an index of workers' exposure and as a measure of the effectiveness of engineering controls and operating procedures. As noted earlier, Dr. Redmond concluded that her study indicated that this was probably an adequate level of protection (Ex. 8-29, p. 388). In fact, the recalculation of the 0.56 mg/m³ (560 ug/m³) level using the customary mid-point analysis resulted in a level

of approximately 0.22 mg/m³ (220 ug/m³) (TR 1012-3). However, Dr. Redmond did report that analysis of the data using a latent period model led to the conclusion that there was no exposure level that could be considered safe (TR 422).

The analysis performed by Dr. Land supported this conclusion (Ex. 82, Table 3). At all of the investigated exposure levels (.05-1.00 mg/m³ BSFTPM), dose models (0, 5, 10 and 15 year lag) and dose-response models (quadratic and linear) a statistically significant excess risk of lung cancer (Ex. 82, Table 3) was found. For example, according to Dr. Land's calculation (Ex. 82, Table 3), assuming a quadratic dose-response model and latency periods of zero, five, ten, and fifteen years, the excess risks of lung cancer associated with OSHA's current standard of 0.2 mg/³ [*sic*] are 0.0029, 0.0036, 0.0045 and 0.0061 respectively. The corresponding relative risks are 6.2%, 7.7%, 9.5%, and 13.1% greater than the normal risk. Assuming a linear dose-response model, the excess risks for the same latency periods are 0.0191, 0.0209, 0.0244, and 0.0294 respectively with corresponding relative risks of 41%, 45%, 52%, and 63% greater than the normal risk.

Putting the above calculations into more general terms, Dr. Land said (TR 3858),

> As a final statement, I would just also point out that it has not been my task to weigh the costs of reducing coke oven emissions against excess risks associated with not doing so; but it is possible to note from these analyses that the estimated excess risks corresponding to average coal tar pitch volatile levels around .2 milligrams per cubic meter of air, which, I believe, corresponds roughly to the proposed standard, are not negligible, even for those dose response models and latency assumptions that give the smallest estimates of risk.

Then from the point of view of choosing a safe level of exposure, the permissible exposure limit should be set at zero. However, based on the evidence in the record, OSHA does not believe that a zero standard for exposure to coke oven emissions is technologically feasible. In fact, it is clear that for any of the indicator substances considered, certain quantities of each substance are present in the ambient environment as a result of natural phenomena and as artifacts of human activity.

The Advisory Committee recognized this issue and proposed that the standard be set at a level equivalent to "background" for B(a)P as the next best approach to a zero standard. The Chairperson of the Committee explained this approach as follows (Ex. 14):

> Since coke oven emissions are carcinogenic and there is no scientific data to demonstrate that there is a safe level of exposure to carcinogens the basis of this standard must be "no exposure." It is true, however, that in the ambient environment, there are certain compounds arising from various combustion processes which are the same as those arising from coking operations.
>
> The basis of this standard is no permissible exposure over background levels as measured in representative urban environments removed from the influence of coke oven emissions * * *.
>
> This limit is based on an evaluation of the best available scientific evidence, and on a judgment that the health and safety of employees must be protected to the fullest possible extent.

The proposal, while based on a different indicator substance from B(a)P was an effort to establish a respirable particulate standard roughly equivalent to background consistent with the Advisory Committee recommendations.

While a permissible exposure limit equal to zero plus background would represent the lowest level theoretically possible, OSHA believes that the record shows such an approach is not feasible. Even if such a number could be determined, achieving a standard of zero plus background would require that the emissions from a coke oven be effectively zero so as not to increase employee exposure above background levels. There has been no evidence presented that would convince OSHA that such a complete elimination of coke oven emissions can be achieved by existing or future technology.

OSHA finds that the determination of an appropriate permissible level of employee exposure to coke oven emissions relies in part on the record of this proceeding and in part on policy considerations which lead the Agency to conclude that in dealing with a carcinogen or other toxic substance for which no safe level of exposure has been demonstrated, the permissible exposure limit must be set at the lowest level feasible. Such a determination involves a measure of subjective judgment which OSHA believes is justified by the nature of the hazard being dealt with and the intent of the Act. Section 6(b)5 provides that the standards for toxic substances shall be feasible. That section further provides that:

> In addition to the attainment of the highest degree of health and safety protection for the employee, other considerations shall be the latest available scientific data in the field, the feasibility of the standards, and experience gained under this and other health and safety laws.

OSHA has determined that 150 ug/m³ is the level which most adequately assures, to the extent feasible, the protection of coke oven workers. Several factors have been considered in making this determination and are discussed below.

The estimated excess risks of lung cancer mortality due to occupational exposure to BSFTPM at the 150 $\mu g/m^3$ level are less than the risks from exposure at the level of the existing standard, 0.2 mg/m^3 (200 $\mu g/m^3$) according to interpolations performed by OSHA from Dr. Land's calculations (Ex. 82, table 3). Thus, for the same hypothetical individual that has been used in the preceeding examples, assuming a linear dose-response model and latency periods of zero, five, ten and fifteen years, the excess risks at the 150 $\mu g/m^3$ level of exposure are 0.0145, 0.0159, 0.0184, and 0.0223, respectively. The corresponding relative risks of 1.034, 1.043, 1.053, and 1.477 times the normal risk. Assuming a quadratic dose-response model, the excess risks are 0.0016, 0.0020, 0.0025, and 0.0034 respectively, with corresponding relative risks of 1.034, 1.043, 1.053, and 1.072 times the normal. The lowering of the permissible exposure limit clearly represents a lowering of the risks associated with exposure to coke oven emissions.

The level of 150 $\mu g/m^3$ is a feasible one. Although the industry generally has failed to utilize emissions control technology which has been available for some time (e.g. stage charging has been in existence since 1961 (Ex. 2-37c; 2-19)) and have exceeded the existing permissible exposure limit of 0.2 mg/m^3 (Ex. 68), exposure levels below 150 $\mu g/m^3$ have been reached at various times on various batteries for various job classifications (Ex. 49E; 51A; 2-146; 2-223).

The strongest evidence of this performance is the NIOSH study of U.S. Steel's Fairfield, Alabama plant (Ex. 2-223, table 1). For all of the seven job categories tested, on at least one of the three days during which samples were taken, exposure levels were below the 150 $\mu g/m^3$ level. Three job categories (larryman, cokeside helper, and quench car operators) registered below this level on two days. Furthermore, for three of the job

categories (pushside door machine operator, pushside helper, and quench car operator) no detectable level of exposure was measured. OSHA is mindful that many of the measurements taken by NIOSH at Fairfield show levels above 150 $\mu g/m^3$, however, the Agency believes that the lower measurements are a strong indication that these levels are attainable.

OSHA recognizes that Fairfield is generally considered to be the best coke plant in terms of controlling emissions. In fact, EPA uses Fairfield as a data base for their new source performance standards for coke plants (TR 1971). However, even Fairfield does not utilize all of the specific engineering controls that OSHA believes are effective in reducing exposures and have been required in this standard. For example, Fairfield has no filtered-air cabs or standby pulpits (TR 2066). Nor does Fairfield have all of the additional controls that are not specifically required, but may be helpful, such as canopies to capture and remove door emissions (TR 3078). OSHA believes, therefore, that by utilizing all of the required controls and additional existing controls, Fairfield could be doing even better.

OSHA also believes that other coke plants can follow Fairfield's lead. Fairfield is a rehabilitated battery (Ex. 41A), which suggests that existing batteries can likewise be rehabilitated to perform with similar success. New batteries should be able to do even better, since they are not faced with the space, design and other constraints sometimes imposed by rehabilitation of a battery.

Furthermore, as the Courts of Appeals have emphasized, OSHA is not restricted by the status quo. Standards may be set which require improvements in existing technologies or which require the development of new technology, and OSHA is not limited to setting standards based solely on devices already fully developed (see e.g.,

Society of Plastics Industry v. *U.S. Department of Labor*, 509 F.2d 301 (c.A.2, 1975) [*sic*] cert. denied).

OSHA agrees with the statement of David J. Burton, the contractor who performed the technological and economic feasibility studies, that "* * * implementation of the standard and of efforts to control employee exposure will undoubtedly create an atmosphere in which new and innovative control technology will be developed." (Ex. 116, p. 4).

In fact, there is new and innovative control technology looming on the horizon. For example, there was extensive testimony at the rulemaking hearings on the effectiveness and feasibility of new door sealing techniques which may lead to the almost total elimination of door leaks (Ex. 30; 66F; Ex. 144, App. A, p. 77). As another example, there was testimony regarding new techniques for the quenching of coke which could greatly reduce the emissions resulting from the pushing process (Ex. 30; 33; 33D). Further, there was testimony concerning alternative methods of coke production (Ex. 2-61, p. 128-160).

OSHA has carefully considered the issue of economic feasibility in the course of this rulemaking and is convinced that the control measures which are necessary for the reduction of employee exposure to the permissible exposure limit are well within the economic capabilities of the industry (see Economics). Therefore, OSHA finds that the level of 150 $\mu g/m^3$ is economically, as well as technologically, feasible.

Therefore, pursuant to OSHA's authority to force technology and in consideration of the evidence of new technology looming on the horizon, OSHA has determined that it is appropriate to allow for the factor of technology forcing in ascertaining that the 150 $\mu g/m^3$ level is feasible. OSHA believes that this level is not

infeasible by virtue of being at or below background levels, which would effectively require the emission-free operation of coke ovens. The reasons for this are threefold. First, the National Air Sampling Network estimate of benzene-soluble organic matter background levels (approximately 10 $\mu g/m^3$) is significantly lower than the permissible exposure limit (Ex. 14). These measurements are, however, taken with different samplers, (high volume) and over a longer (24 hour) time period, and may not be directly translatable to sampling methods which are required by the standard. Second, the measurement of "no detectable levels" at Fairfield suggests that background falls below the limit of detectability (approximately 20 $\mu g/m^3$) of the sampling method (Ex. 2-223). Third, as stated earlier, there is general agreement that BSFTPM is the indicator substance whose measurement is least affected by interference from background (TR 1928; TR 2493-4). It should be noted that OSHA acknowledges that the 150 $\mu g/m^3$ level is not absolutely safe and that the risks associated with lower levels of exposure which were considered (e.g. 50 $\mu g/m^3$ and 100 $\mu g/m^3$) are correspondingly lower. However, as an exercise of rational Agency discretion, OSHA has determined that based upon the evidence available at this time, a permissible exposure limit lower than 150 $\mu g/m^3$ may not be feasible. This, of course, does not preclude the possibility that the level will be lowered in the future if the evidence available at that time establishes that it would be feasible to do so.

* * * *

9. *Written plans for compliance.* In order to insure compliance with this standard, employers are required to establish and implement two written programs. First, a written program must be drafted which describes, in detail, current operating procedures as well as projected engineering controls and work practices, specifically de-

lineated in the standard, which will reduce employee exposures to or below the permissible exposure limit. Such a written program will set forth specific time frames by which the engineering controls and workpractices will be in place. If the employer has implemented all required controls and practices within specified time frames, and permissible exposure limits are nonetheless exceeded, then the standard requires the formulation and implementation of a second written program—compelling the employer to utilize any existing technology and to develop new technology necessary to achieve full compliance with the standard.

OSHA derives legal support for a technology-forcing standard from the rulings of the Courts of Appeals (See e.g., *Society of Plastics Industry* v. *U.S. Department of Labor*, 509 F. 2d 301 (C.A. 2, 1975) cert. denied; *AFL-CIO* v. *Brennan*, 530 F. 2d 109, 121-122 (C.A. 3, 1975). Moreover, the coke oven emissions standard marks the first attempt by the Secretary to combine the specificity of a standard which particularizes required engineering controls and work practices with the flexibility which permits employers to tailor their written programs to the exigencies of their batteries. In addition, the specificity of the final standard finds further support in section 6 (b) (7) of the Act which states in pertinent part: "Where appropriate, such standard shall also prescribe suitable protective equipment and control or technological procedures to be used in connection with such hazards * * *" (Emphasis added.) Furthermore, a standard which specifies a compendium of required controls and practices is promulgated in cognizance of similar plans which have been developed in the context of litigation (Ex. 68J; 68K). Nevertheless, although these agreements marked an important first step under the former general, nonspecific CTPV standard, they further underscore the necessity for a uniform standard of compliance which directs employers

to specific abatement programs and allows the Secretary more easily to monitor an employer's progress in achieving full compliance.

Another issue for discussion under this section involves the efficacy of OSHA's enforcement procedures in insuring uniform compliance with the requirements of this standard. The Advisory Committee recommended a procedure, apart from the citation mechanism, for OSHA review and approval of an employer's written plans. The agency has determined that the alternative compliance strategy described below will more adequately insure uniform compliance, especially within the context of limited OSHA resources which preclude the advance approval of all abatement plans.

Thus, as detailed in OSHA's Industrial Hygiene Manual, citations will be issued for the failure to comply with the requirements of the standard. The citation will set forth "standard alleged violation elements" (SAVE) including specific time frames by which the cited employer must come into initial (development of a plan), intermediate (hiring an expert consultant, ordering requisite materials, etc.) and final compliance (specific controls in place). During the course of implementation, OSHA will periodically monitor the employer's progress in order to ensure compliance with the elements of the citation. Further appropriate enforcement action will be taken if the permissible limit is still exceeded and the employer fails to develop and implement a technology-forcing program.

The Department is cognizant of the concerns of the unions and the Advisory Committee that the implementation of this standard through the traditional enforcement mechanism may lead to its inconsistent application by OSHA field staff. We would offer several responses. First, such variegated interpretation would not be obviated by any pre-citation plan approval process. Indeed, the same personnel would be reviewing the plan's efficacy

regardless of the enforcement or pre-enforcement context in which it was presented. Second, OSHA simply does not have the resources in sufficient numbers to review every coke oven plan required by this standard. Rather, the agency must rely on the deterrence achieved through periodic general inspections and the intensive review and monitoring which will follow such inspections. Third, in the implementation of this standard, field personnel will be advised by a Technical Advisory Unit based in the National office which will gather all coke oven information and coordinate all coke oven citation and settlement policy.

Finally, a difficult compliance issue presented by the promulgation of the new standard involves its relationship, within the context of enforcement, to the employer's legal obligations under the prior standard (29 CFR 1910.1000, 1002). The present standard, at paragraph (f) (1) (i) requires the implementation of specific engineering controls and work practices at the earliest possible time but no later than January 20, 1980. To this end, employers are presently required to develop written programs and to implement specific controls. However, the agency recognizes that employers had a legal obligation under the prior standard to reduce coke oven emission exposures by means of feasible engineering and administrative controls. It is not the intention of the agency, through the promulgation of this standard, to vitiate the legal requirements under the old standard Rather, OSHA views the two standards as representing continuum of enforceable obligations which have been crystallized in the standard's promulgation.

More specifically, in evaluating whether the employer has instituted controls at the earliest possible time, OSHA compliance personnel would consider not only the employer's performance under the new standard but also his prior obligations under its predecessor. It is OSHA's

view that recalcitrant employers who have implemented only a few or no controls or work practices under the prior CTPV standard should not benefit from a newly extended time frame established under the new standard. Rather, cognizant of their prior legal obligations, such employers would be subject to citation under the new standard for failure to implement controls at the earliest possible time.

* * * *

APPENDIX H

Council on Wage and Price Stability, *Report to the President on Prices and Costs in the United States Steel Industry* (October 1977), xi:

"EXECUTIVE SUMMARY

"The United States steel industry was hard hit by the deep recession of 1974-75 and the sluggish recovery of world steel demand that followed. The continuation of depressed economic conditions might well be expected for an industry whose major markets are within the highly cyclical durable goods producing sector. . . .

"Steel has been a problem sector of the U.S. economy for nearly two decades. The problems are evident in that:

—Current capacity utilization rates in the industry are near 80 percent compared to a peak of 97 percent in 1973. Profit rates are less than half of 1974 peak levels.

—The U.S. balance of trade in steel has shifted. In 1955, the U.S. exported more steel than it imported; today imports are supplying nearly 18 percent of domestic requirements and our exports of steel are negligible.

—Finished steel prices have risen substantially in excess of the increase in other industrial prices.

Within the last two years these factors have come together to worsen economic conditions in one of the nation's more basic industries."

APPENDIX I

U.S. DEPARTMENT OF LABOR
OFFICE OF THE SOLICITOR
WASHINGTON, D.C. 20210

April 26, 1978

Thomas F. Quinn
Clerk,
United States Court of Appeals
for the Third Circuit
21400 U.S. Courthouse
601 Market Street
Philadelphia, Pennsylvania 19106

Re: *AISI, et al.* v. *OSHA*, Nos. 76-2358, etc.

Dear Mr. Quinn:

On March 28, 1978, a three-member panel of this Court, composed of Circuit Judges Rosenn and Higginbotham, and District Judge Van Artsdalen sitting by designation, issued its opinion and judgment in the above case. Subsequent to this decision, the petitioners, by letter dated April 13, called the Court's attention to what they characterized as "three unintentional errors or inconsistencies that . . . should be corrected prior to issuance of the printed Opinion." The Court thereafter directed the respondent Secretary of Labor and intervenor AFL-CIO to respond to the industry's contentions by April 25. This letter constitutes the Secretary of Labor's response.

1. The Secretary agrees with petitioners that the Court intended to vacate the requirement for *quantitative* fit testing rather than *qualitative* fit testing which was referenced in the opinion and judgment. Although the particular provision vacated contained a requirement for

both *qualitative* [1] and *quantitative* [2] fit testing, it was only *quantitative* fit tests that petitioners challenged (AISI opening brief, pp. 37-38) and on which the Secretary admitted error (Secretary's brief, p. 81 and n. 47). Accordingly, the inadvertent reference to *qualitative* fit testing in the opinion and judgment should be corrected to reflect that it is only the portion of the provision establishing a *quantitative* fit testing requirement which has been vacated.

2. The Secretary does *not* agree with petitioners' contention that, with respect to the application of the standard to non-coke oven employers, the Court intended to state that "the standard will be vacated" instead of "the petition for review will be denied." Since the decision expressly recognized "it would make little sense to apply a health standard to only one group of employees [when] employees of independent contractors suffer the effects of carcinogens as well" (slip opinion, p. 31), it seems clear to us that the Court did not intend to deprive non-coke oven (independent contractor) employees of the vital protections afforded by this standard. Indeed, the Court specifically read the respirator requirements "as applicable to and intended for independent contractors." *Ibid.* Moreover, in both the conclusion of the opinion (*ibid.*) and the judgment, the Court explained that it was remanding the standard insofar as it applied to non-coke oven employers "for further proceedings consistent with this opinion," rather than vacating as it had done with two other provisions. Thus, it is clear that the Court intended to require only some form of supplemental proceedings on the issue of the application of this standard

[1] "The employer shall assure that the respirator issued to the employee exhibits minimum facepiece leakage and that the respirator is fitted properly." 29 CFR 1910.1029(g)(4)(i).

[2] "The employer shall perform quantitative fit tests annually for each employee who uses a nonpowered, particulate filter respirator." 29 CFR 1910.1029(g)(4)(i).

to non-coke oven employers. Petitioners are therefore incorrect when they suggest that the Court intended to vacate the standard. It is the intent of OSHA to reexamine the letter referred to in the Court Opinion, as well as the portions of the program directive dealing with the application of the coke oven standard to non-coke oven employers, and to make any necessary changes, or conduct other proceedings, as appear appropriate in light of the Court Opinion.

3. Finally, the Secretary strongly opposes petitioners' request that the Court now vacate additional provisions of the standard requiring employers to utilize controls beyond those specifically mandated in the regulations.[3] While the Court held that the Secretary could not place an affirmative duty on each employer to research and develop new technology and thus vacated 29 CFR 1910.1029

[3] Those additional provisions include 29 CFR 1910.1029(f)(1)(i)(b), which applies to existing coke batteries and provides:

> The engineering and work practice controls required under paragraphs (f)(2), (f)(3) and (f)(4) of this section are minimum requirements generally applicable to all existing coke oven batteries. If, after implementing all controls required by paragraphs (f)(2), (f)(3) and (f)(4) of this section, or after January 20, 1980, whichever is sooner, employee exposures still exceed the permissible exposure limit, employers shall research, develop and implement any other engineering and work practice controls necessary to reduce exposure to or below the permissible exposure limit except to the extent that the employer can establish that such controls are not feasible. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of paragraph (g) of this section.

29 CFR 1910.1029(f)(1)(ii)(b) and (f)(1)(iii)(b) apply the same requirement to new and rehabilitated batteries, and to beehive ovens respectively.

(f) (6) (iii),[4] the provision which AISI contended (Br., p. 23 and n. 24, pp. 29-30 and nn. 35 and 36) created this affirmative burden, the Court also held that

> the Secretary can impose a standard which requires an employer to implement technology "looming on today's horizon," and is not limited to issuing a standard solely based upon technology that is fully developed today. Slip opinion, p. 28.

Furthermore, the Court made plain throughout its opinion that employers must do more than implement only the particular specified controls. Thus, the Court concluded that the Secretary's permissible exposure limit was feasible in part because of "new alternative coke production techniques and emissions controls" (slip opinion, p. 16) as well as "innovative technology currently in the experimental stage readily adaptable to old batteries" (slip opinion, p. 21); it noted that "the coke oven industry also could with some self-confidence and determination develop their own technological potentialities" (slip opinion, p. 19); and it pointed out that "it becomes self-defeating to bar the use of reasonable and effective engineering controls and work practices." Slip opinion, p. 26. Moreover, these findings are consistent with the Court's careful exclusion of the requirement to "implement" additional controls from its discussion of the invalid requirement to "research and develop" them. Slip opinion, pp. 27-28, *passim*.

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[4] That section provides:

> (iii) If, after implementing all controls required by paragraphs (f)(2)-(f)(4) of this section, or after January 20, 1980, whichever is sooner, or after completion of a new or rehabilitated battery the permissible exposure limit is still exceeded, the employer shall develop a detailed written program and schedule for the development and implementation of any additional engineering controls and work practices necessary to reduce exposure to or below the permissible exposure limit.

The logical conclusion and the one which the Secretary has drawn is that if the Court intended to vacate sections (f) (1) (i) (b), (f) (1) (ii) (b) and (f) (1) (iii) (b) at all, it meant to do so only insofar as those provisions imposed on employers a separate and independent responsibility to conduct research and development.[5] Conversely, the Court did not intend to relieve the employers of their obligation to implement controls which were in existence but not otherwise specifically required, or those that were "innovative technology currently in the experimental stage readily adaptable to old batteries," i.e., "technology looming on the horizon." Accordingly, the Secretary opposes any vacation of the provisions inconsistent with this position.

Sincerely,

/s/ Dennis K. Kade
DENNIS K. KADE
Assistant Counsel for
Appellate Litigation

/s/ Charles I. Hadden
CHARLES I. HADDEN
Attorney

cc: Counsel of record

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[5] This result could be achieved simply by deleting the words "research, development, and" from the (f)(1) provisions, *supra*, n. 3, or by inserting the phrase "as defined in this Court's opinion" after the words "research and develop" in the judgment.